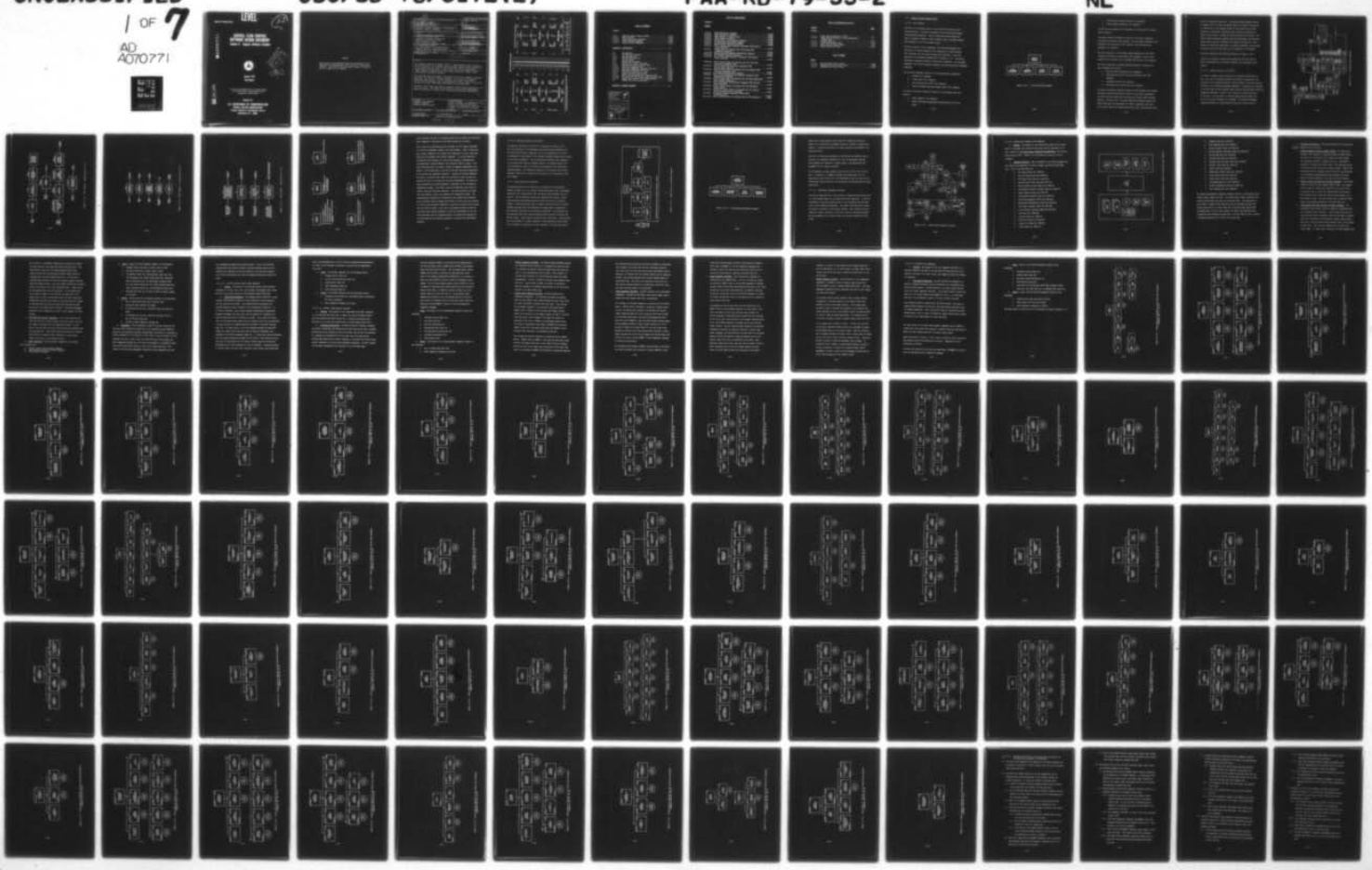
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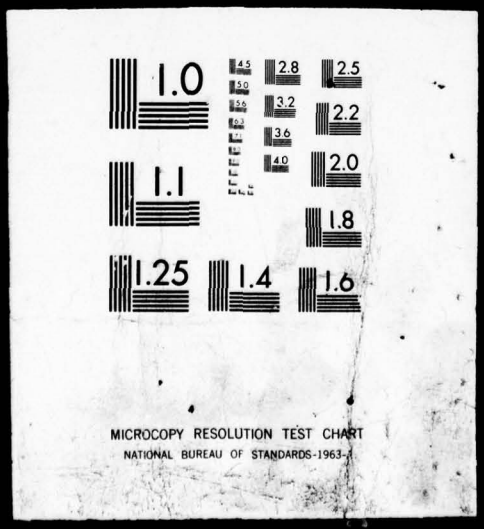
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CENTRAL FLOW CONTROL SOFTWARE DESIGN DOCUMENT

Volume II - Support Software Complex

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January 1979

Final Report

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Systems Research & Development Service
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16. Abstract

The Software Design Document (SDD), a deliverable under Contract DOT-FA77WA-3955, is a design document that defines the translation of the Central Flow Control (CFC) Software System functional requirements established in the Federal Aviation Administration's (FAA) Computer Program Functional Specifications (CPFSs) into implemented Software Programs.

The SDD describes the exact configuration of the computer programs produced for the CFC Software System. It provides a complete technical description of the software functions, structures, operating environment, data organization, visual table of contents, program listings, and data and module cross references.

Volume II describes the Support Complex (SPCX) which operates in an off-line mode. The SPCX is comprised of the System Development, System Generation, System Test, and System Analysis subsystems.

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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
	AREA			
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
	MASS (weight)			
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
	VOLUME			
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
	TEMPERATURE (exact)			
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
	AREA			
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
	TEMPERATURE (exact)			
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

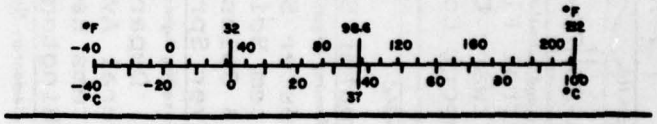


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2.2.2 Support Software Complex (SPCX)

2.2.2.1 SPCX Overview

The SPCX is the offline portion of the Central Flow Control (CFC) Software System. It directly interfaces with the System developers and maintenance personnel. Control stream and source modules are input to generate, execute, store, integrate, test, and audit modules and components of the CFC Software System.

The SPCX consists of four subsystems: the System Development (SD) Subsystem, the System Generation (SG) Subsystem, the System Testing (ST) Subsystem, and the System Auditing (SA) Subsystem. These are depicted in the hierarchy diagram shown in Figure 2.2.2-1. The System Development Subsystem consists of three major components: the Utilities Component, the JOVIAL Processors Component, and the BAL and ALC Assemblers Component.

The Utilities Component consists of the following major components:

- OS/9020 (OS) Component
- Library Edit (LE) Component
- Time Sharing Option (TSO) (TS) Component
- Houston Automatic Spooling Program (HASP) (HA) Component

The JOVIAL Processors Component consists of the following major components:

- JOVIAL Compiler (JC) Component
- JOVIAL Structured Programming Listing Formatter (JS) Component

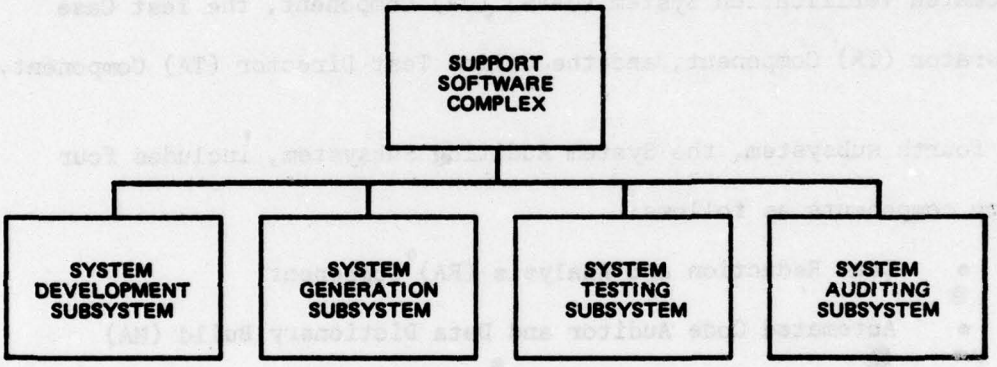


Figure 2.2.2-1. SPCX Hierarchial Diagram

- JOVIAL Source Include Processor (JI) Component
- JOVIAL Library Capability (JL) Component

The BAL and ALC Assemblers (BA) Component is not divided into further major components.

The System Generation Subsystem consists of four major components: the Library Maintenance (LM) Component, the Environment Adaptation (EA) Component, the System Build (SB) Component, and the System Data Assembler (DA) Component.

The major components of the System Testing Subsystem are the JOVIAL Automated Verification System (JAVS) (JA) Component, the Test Case Generator (TR) Component, and the Online Test Director (TA) Component.

The fourth subsystem, the System Auditing Subsystem, includes four major components as follows:

- Data Reduction and Analysis (RA) Component
- Automated Code Auditor and Data Dictionary Build (MA) Component
- Precedence Network (PN) Component
- Maintenance and Certification (MC) Component

The System Development Subsystem manages the SPCX hardware and software resources; provides input/output services to the other subsystems of the SPCX; provides library edit services; and creates object modules, COMPOOL, and data sets. The System Generation Subsystem creates the System data base and incorporates the OPCX's components, data base with initial values, and complex-unique data into a disk-resident OPCX

ready for loading and execution. The System Testing Subsystem serves to enhance the unit testing of System modules, provides the capability to simulate any of the message traffic to be processed by the OPCX Executive or Application Subsystems, and provides the capability to replay a data scenario through the OPCX for system-level testing. The System Auditing Subsystem analyzes past OPCX performance and operation, audits source code for conformance to standards, provides for traceability of functional requirements to software components, and provides facilities for online and offline fault diagnosis of CFC hardware.

The basic functions of the SPCX are presented in Figure 2.2.2-2.

Figure 2.2.2-3 depicts complex-level threads for the SPCX, each of which illustrates one of the major functions to be performed by the complex.

2.2.2.1.1 Logical Structure of the SPCX

The Support Software Complex Subsystems are logically interrelated in such a way that all physical hardware and external considerations are insulated from the System Generation, System Testing, and System Auditing Subsystems by the System Development Subsystem. In addition, all accesses to the data base are made through common routines from the OPCX's Data Base Management Subsystem. Figure 2.2.2-4 depicts the logical structure of the SPCX. The initiation of activity begins with the input of a set of Job Control Language (JCL) commands. The System Development Subsystem performs the communications handling to receive the JCL,

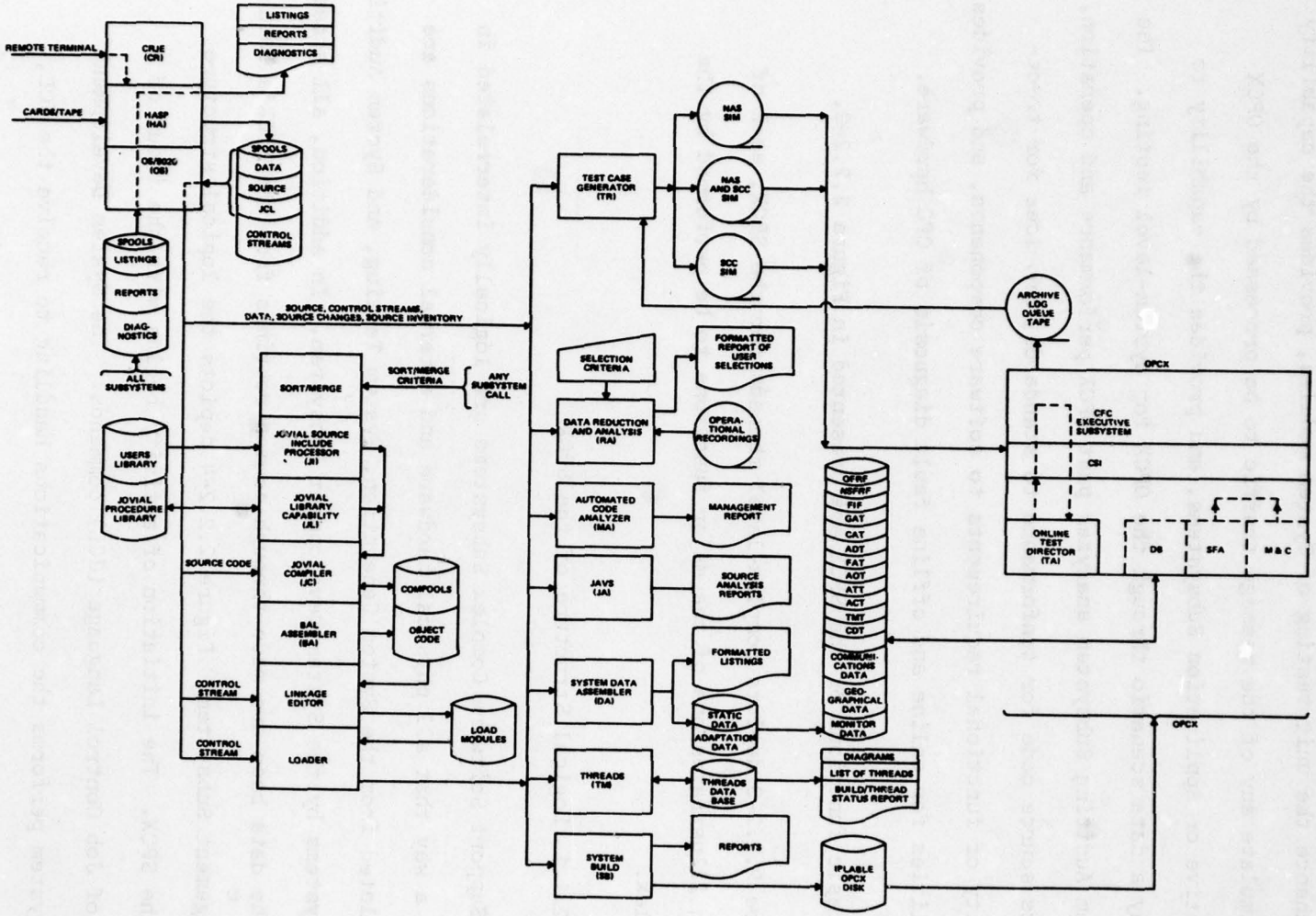


Figure 2.2.2-2. SPCX Functional Overview

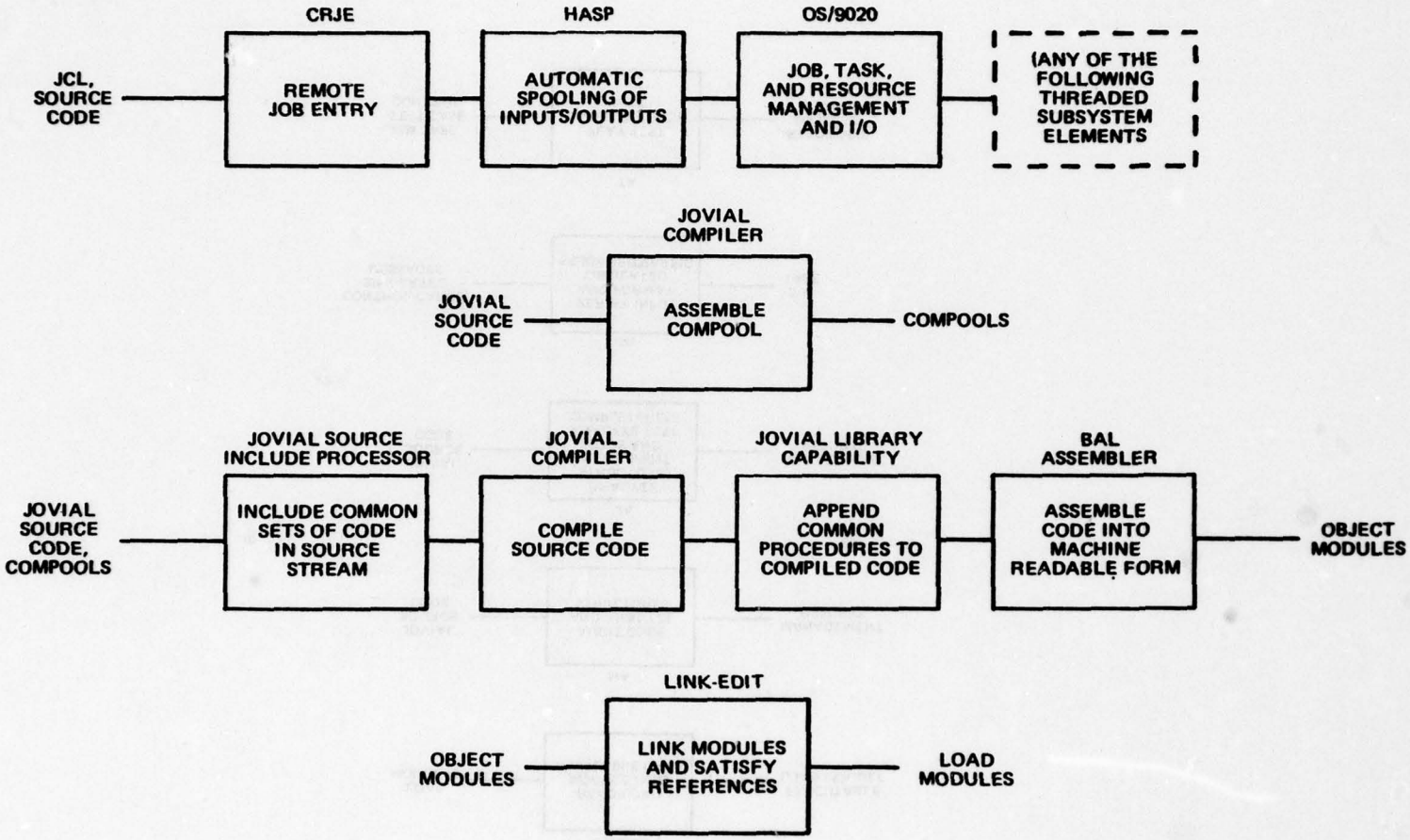


Figure 2.2.2-3. SPCX Threads - Complex Level (1 of 3)

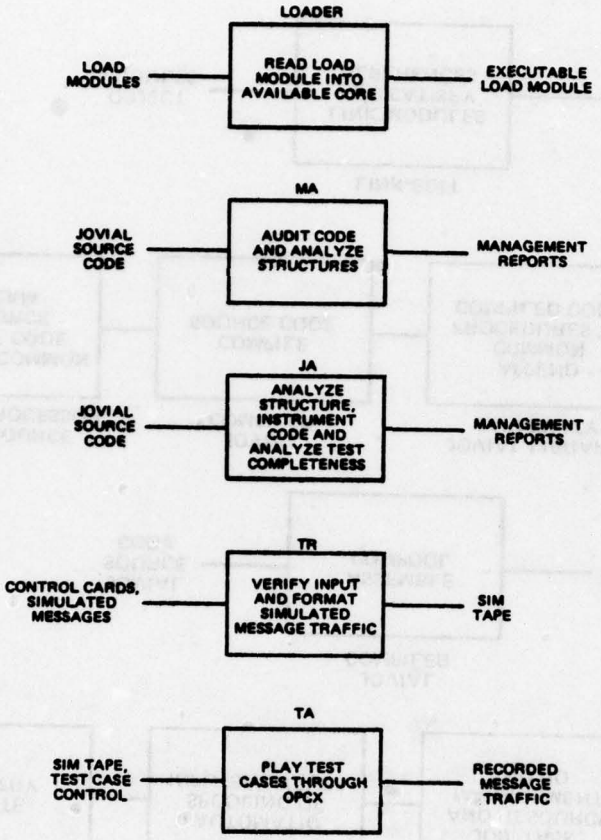


Figure 2.2.2-3. SPCX Threads - Complex Level (2 of 3)

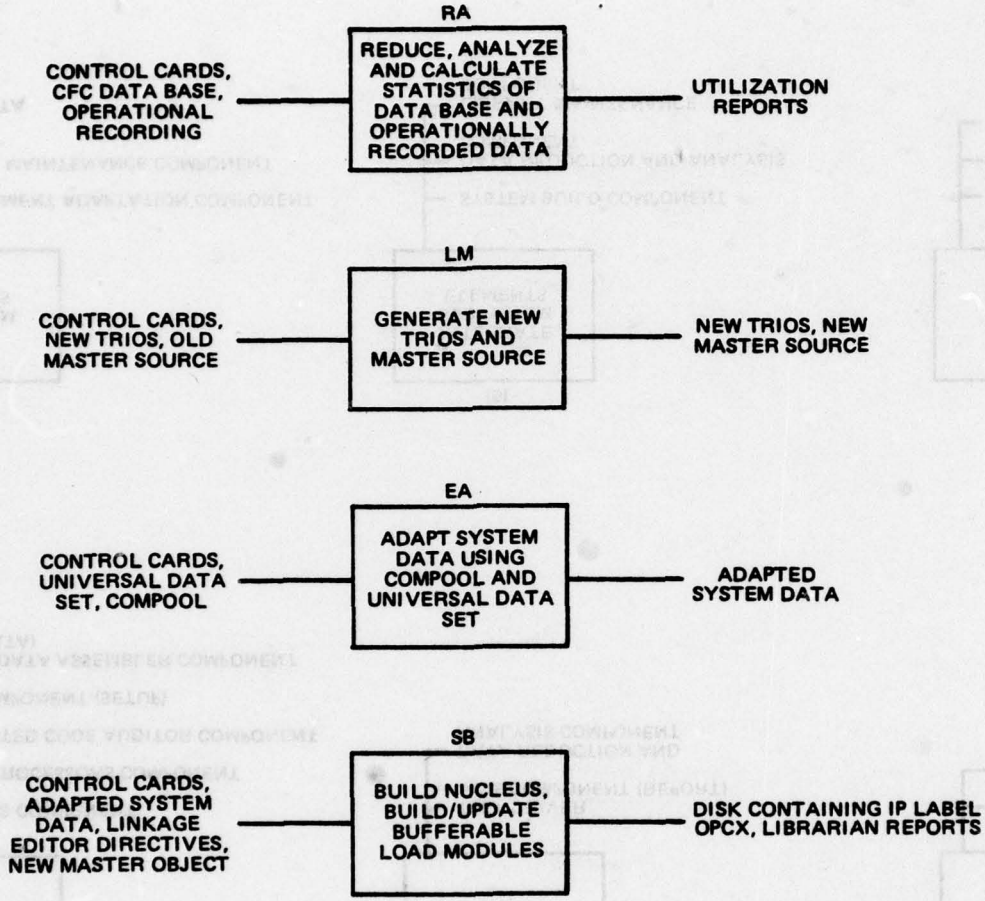


Figure 2.2.2-3. SPCX Threads - Complex Level (3 of 3)

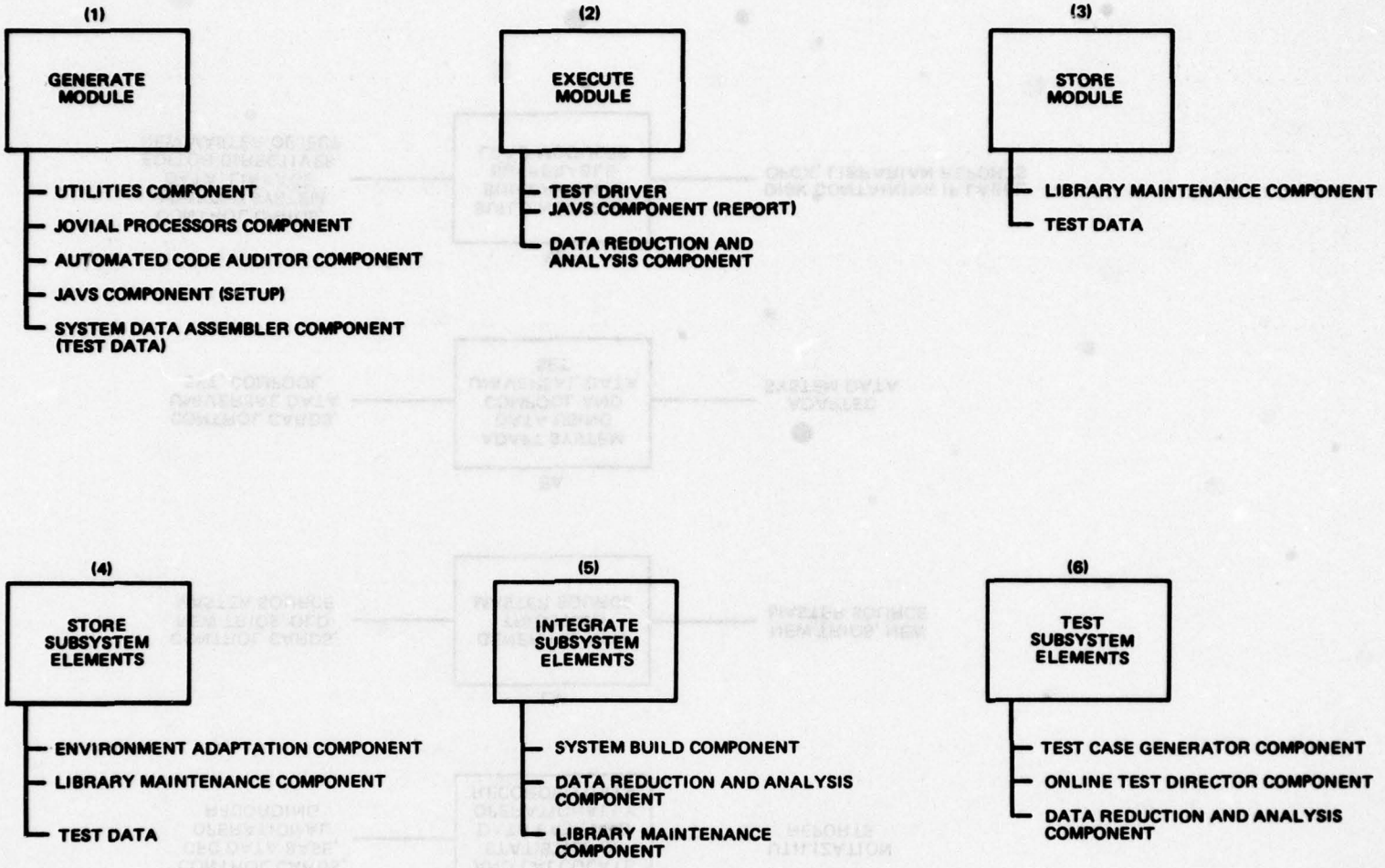


Figure 2.2.2-4. SPCX Logical Structure

then determines the type of processing required and invokes the particular major component to perform the functions required by the input.

Thus, these four subsystems provide the basis for the logical sequences of the SPCX to generate, execute, and store modules. After a module has been cleanly compiled, it is audited for compliance to source code standards by the Automated Code Auditor Component. It is then submitted through the JAVS Component for source code analysis, instrumentation and generation of module/COMPOOL cross-reference which is input to the Data Dictionary Build to produce a report of symbols referenced by the module. At the same time, a test set of the data base may be generated by the System Data Assembler Component. Using the Utilities Component, the module is executed and outputs are collected so that the user can analyze the level of testing that has been accomplished. The module is again processed by the JAVS Component to determine if the testing has exhausted all paths. The module, along with applicable test data, is stored, using the Utilities Component. The stored modules are linked into load modules, stored, and prepared for integrated testing. The subsystem-level elements are integrated by the System Build Component into an IPLable (initial program load) OPCX, and test cases are prepared by the Test Case Generator Component to provide for System level testing. Then the OPCX is loaded, a test case is processed through the OPCX by the Online Test Director Component to test the functioning of the four OPCX subsystems, and the recorded results are reduced and analyzed by the Data Reduction and Analysis Component to provide OPCX performance measures.

2.2.2.1.2 Physical Structure of the SPCX

The physical structure of the SPCX is illustrated in Figure 2.2.2-5. With the exception of the Maintenance and Certification Component, and the Online Test Director Component, all of the components of the SPCX are executed as load modules on the offline redundant simplex under control of the OS/9020 Component. The CFC Simulation Interface (CSI) Component of the Online Test Director Component exists as a program element (PE) that functions as a part of the Executive Subsystem of the Operational Software Complex. The remaining components of the Online Test Director Component function as a transaction load module in the Operationsl Software Complex.

2.2.2.2 System Generation Subsystem

The System Generation (SG) Subsystem, as described in the hierarchy diagram of Figure 2.2.2-6, includes Library Maintenance (LM), Environment Adaptation (EA), System Build (SB), and System Data Assembler (DA) Components. The LM Component produces and updates master source, object, cross-reference and program descriptor table (PDT) sets and analyzes COMPOOL. Modifications were made to support software written in OS/9020 Assembly Language (ALC) and documented as change pages to appropriate NAS documents from which the LM software originates. EA represents the non-executable BAL source code containing initial values for certain CFC Monitor tables. These tables are coded in BAL source form. Their maintenance is performed in a manner identical to any executable source module. The SB Component incorporates all OPCX components, the data base and EA

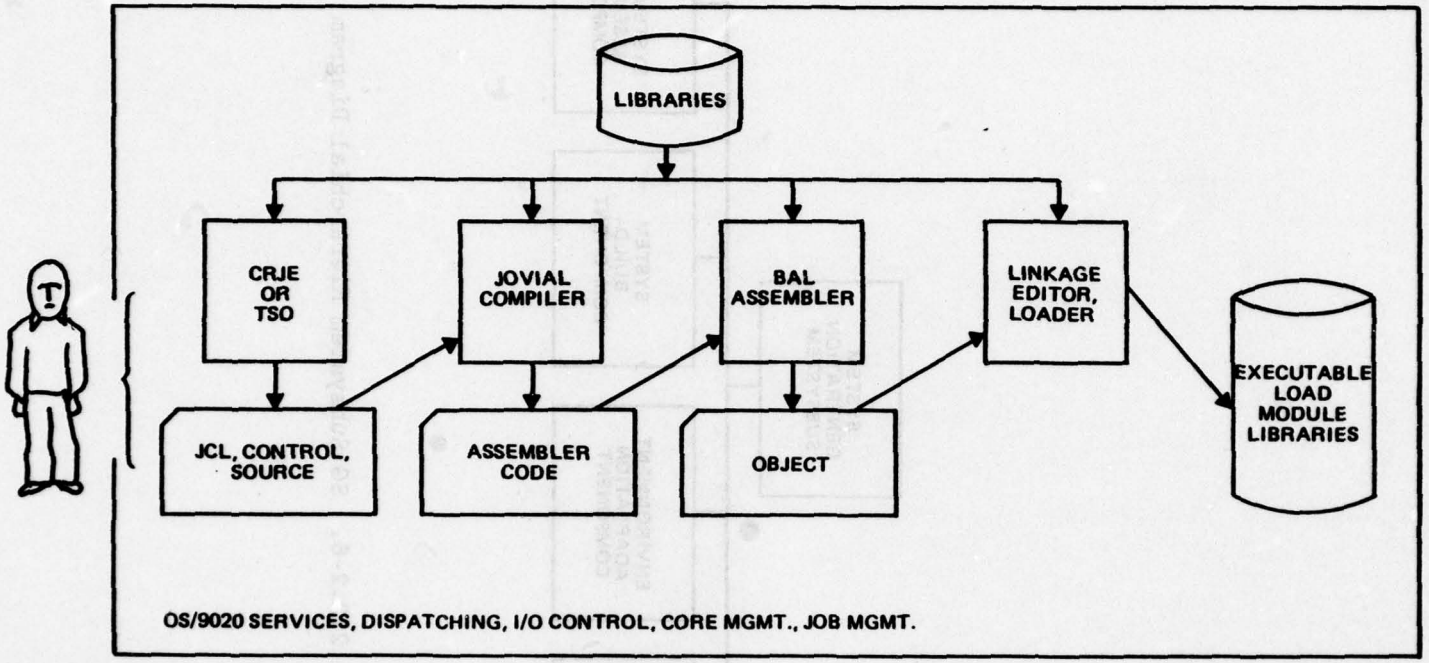


Figure 2.2.2-5. Source Code to Load Module Sequence

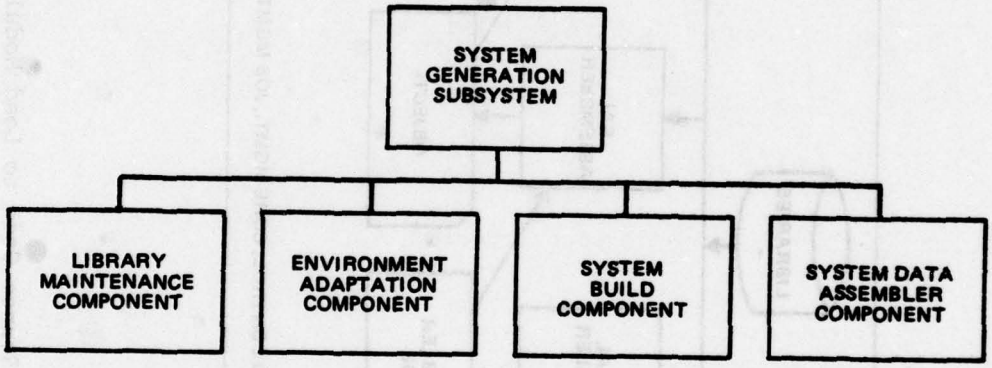


Figure 2.2.2-6. SG Subsystem Hierarchial Diagram

tables into a disk-resident entity ready for loading and execution. Figure 2.2.2-7 depicts the processes required to perform a system build using SB. Detailed descriptions of these processes are provided in the System Build SDD.

Like LM, SB software was furnished by the FAA and was modified only as required to accommodate differences in the CFC development approach. These changes were reflected in update pages to the appropriate NAS documents for the original software.

The DA Component creates, updates, and lists all sets of the CFC data base. In addition, it merges bi-monthly OAG update tapes into the Operational Flight Record Set of the data base as well as cleans up and deletes dead records from both the Operational and Non-Operational Flight Record Sets.

2.2.2.2.1 Environment Adaptation Component

Environment Adaptation (EA) is the process of adapting system-unique data to a form readily usable by the System Build (SB) Component. In the CFC Environment, such unique data pertains to the CFC Monitor and the definition of the hardware environment. The tables containing these values are coded as constants in BAL overlay modules. These modules are maintained in a manner identical to the source code for executable modules and are assembled into an object format by the BAL Assemblers for use by SB.

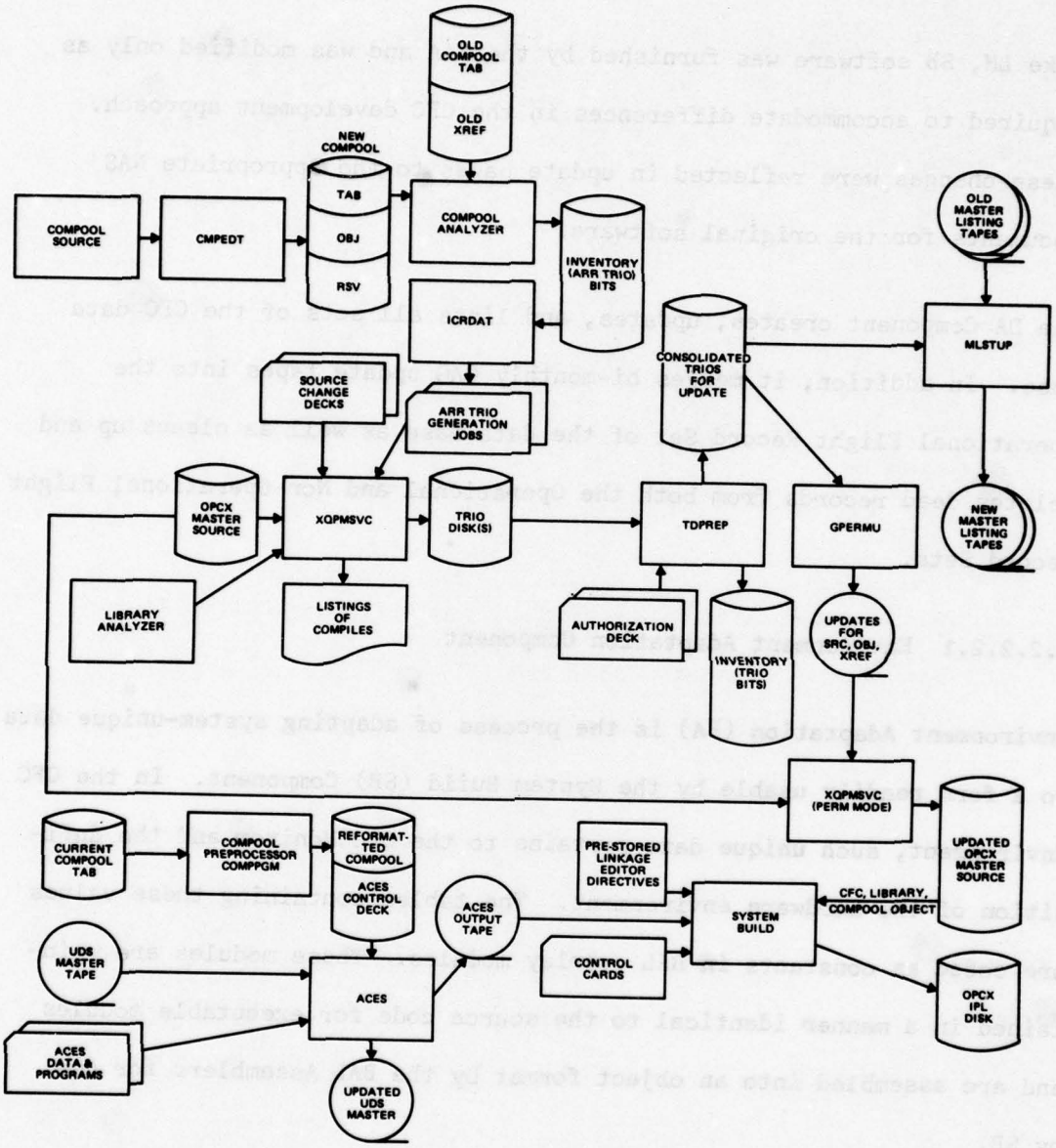


Figure 2.2.2-7. System Build Component Overview

2.2.2.2.2 System Data Assembler (DA) Component

a. Purpose. The purpose of the System Data Assembler (DA) Component is to assemble the various CFC data base sets as specified in the CPFS, Volume III, Off-Line Support Subsystem Specifications, that will be used online by OPCX. Figure 2.2.2-8 provides an overview of the DA Component.

b. Component Overview. The DA Component is an offline program that will provide the capability to create, update, and list the data base sets. Sets in the data base are:

- OAG Flight Record Set (OFRS-OF)
- Non-OAG Flight Record Set (NFRS-NF)
- OAG Flight Index Table Set (OFIT-IX)
- Non-OAG Flight Index Table Set (NFIT-XI)
- Normal General Aviation Table Set (NGTS-NJ)
- User-Supplied General Aviation Table Set (UGTS-UJ)
- Normal Capacity Table Set (UCTS-NY)
- User-Supplied Capacity Table Set (UCTS-UY)
- OAG Arrival/Departure Table Set (OADT-OS)
- Non-OAG Arrival/Departure Table Set (NADT-NS)
- OAG Flight Accession Table Set (OFAT-YX)
- Non-OAG Flight Accession Table Set (NFAT-XY)
- Zone Table Set (ZOTS-ZO)
- Continue Table Set (CONT-CO)
- Arrival Fix Table Set (FXTS-AV)
- Airport Fix Table Set (AFTS-AF)
- Center Table Set (CETS-CP)

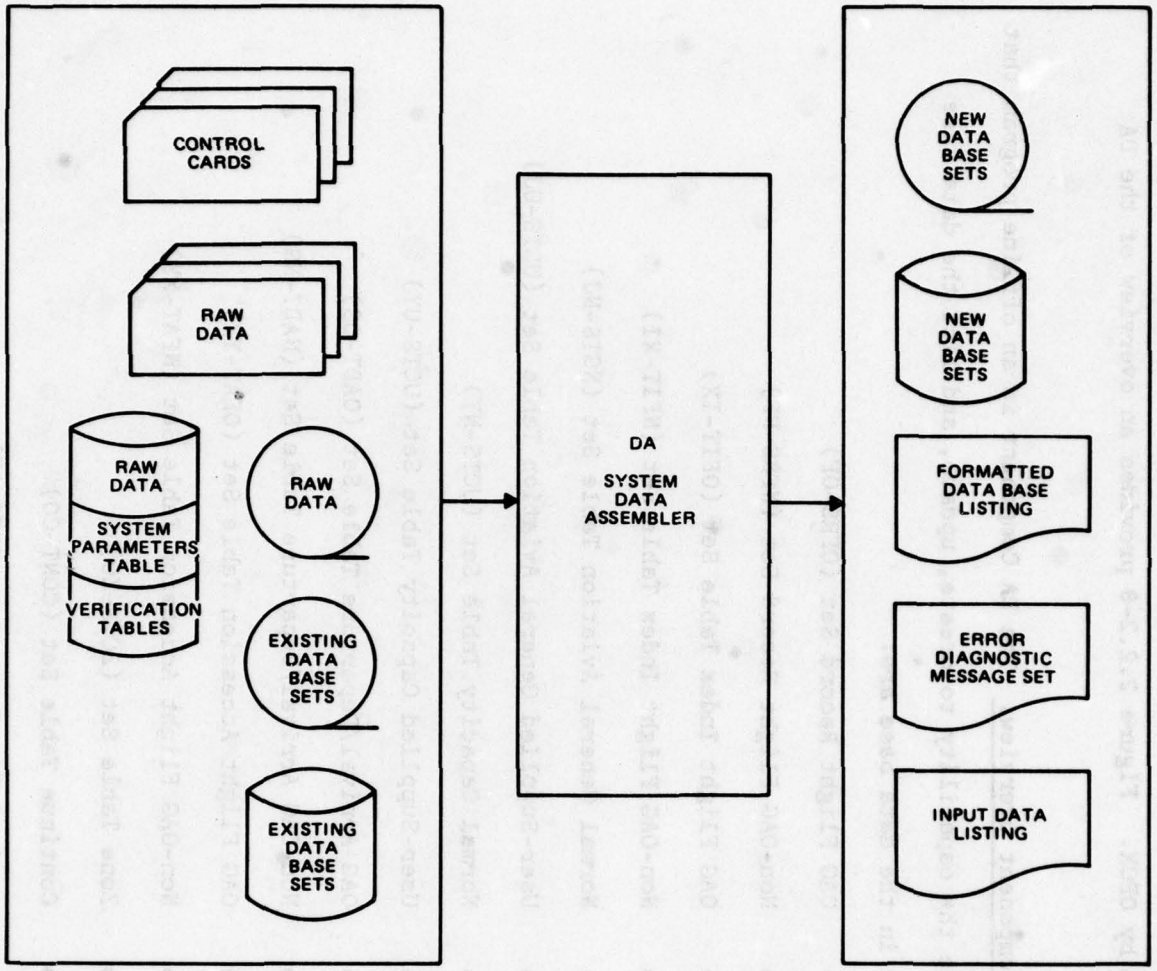


Figure 2.2.2-8. DA-1.0 System Data Assembler Component (DA) System Level Overview

- Parameter Table Set (PATS-PT)
- Table Mapping Table Set (TMTS-TZ)
- Airline Operator Table Set (AOTS-AO)
- Airline Operator Conversion Table Set (AOCS-VW)
- Non-OAG Name Table Set (NOTS-NO)
- Aircraft Type Table Set (ATTS-PY)
- Aircraft Type Conversion Table Set (ATCS-PW)
- Aircraft Class Table Set (ACTS-PK)
- Airport Table Set (APTS-AP)
- Operational Category Table Set (OCTS-OK)
- Output Format Table Set (OFTS-OX)
- Output Device Table Set (ODTS-OD)
- OAG Housekeeping Table Set (OHOT-HS)
- Non-OAG Housekeeping Table Set (NHOT-HK)
- Error Message Table Set (TEMS-MM)

The System Data Assembler Component operates under four user-defined modes: create, merge, update, and list. The create mode is used to generate completely new data base sets from raw input data sets. The merge mode is used either to merge new OAG tape data with the existing data base OAG Flight Record Set or to clean either OAG or non-OAG Flight Record Sets. The update mode is used to add, change, and delete user-specified data records from the existing data base sets. The list mode is used to produce a formatted listing of all or part of the data base.

c. Functional Description. Functions performed by the System Data Assembler Component are as follows:

1. Control Component Function (DAEXEC) Module. The System Data Assembler (DA) Component is entered through the DAEXEC Module. The function of this module is to control the flow through the remaining components. DAEXEC first calls the DA-PRCN Component to process the control cards. This component builds an Interface Control Table Set of control values. DAEXEC then determines from the Interface Control Table Set the processing to be performed and appropriately calls either the Create/Update (DA-CRUP) Component or the List (DA-LIST) Component.

2. Process Control Card Function (DA-PRCN) Component. The DA-PRCN Component reads the input program control cards. The program control cards are decoded and verified for the correct mode of operation and for valid user identification and password. The Interface Control Table Set used by other modules is set with control values. The user-defined mode of operation determines the processing performed on the input data sets.

3. Create/Update Data Base Function (DA-CRUP) Component. The operational mode (create, merge, or update) is determined from the Interface Control Table Set. The raw input data sets containing flight record information (from the OAG tape) or general table sets information are verified for correct syntax and/or data values and are converted from external form to the required internal form. Then they are formatted into the data base record image. In create mode, initially, the Table Mapping Table

Set is built. If required, formatted data records are sorted and then written to the specified output data base sets. The merge mode is valid only for either merging new OAG tape flight records with the existing data base flight records or cleaning OAG or non-OAG Flight Record Sets. In this mode, formatted data records are sorted and compared against existing data base flight records. All valid flight records are collected, sorted, and output to the output data base sets. Flight record set associated table sets are recreated. In the update mode, new records are added to the existing data base sets if the update mode is "add"; existing data base sets data records are changed with new data-item values if the update mode is "change" or specified data records are deleted from the existing data base sets if the update mode is "delete." Data Base Management Subsystem utility components are used to add, change, or delete records.

4. List Function (DA-LIST) Component. If the user specifies the list input option on control cards, then input control and data set images are printed with the appropriate header. In the case of the data base list mode, data records are retrieved from the specified sets. Data record data-item values are converted from internal to external form, formatted in output report format, and output to the requested device.

d. Major Components. The three major components of the System Data Assembler are:

- Process Control Card (DA-PRCN) Component
- Create/Update Data Base (DA-CRUP) Component
- List (DA-LIST) Component

e. Input. Inputs to the DA Component consist of the following;

- Program control card sets on cards, tape, or disk
- Raw input data sets on cards, tape, or disk
- DA parameter table sets (Authorization Table Set, Data Set Description Set, Header Format Table Set, Data Base Record Description Set, Non-OAG Flight Accession Table Set, OAG Record Description Set, Table Ordering Table Set, Table Dependency Table Set, and Verification Table Sets)
- Existing data base sets on tape or disk for update, merge, or list mode

f. Output. Outputs from the DA Component consist of the following;

- New or updated data base sets on tape or disk
- Listing of input control card image
- If requested by the user, listing of input raw data card image
- If requested by the user, formatted listings of all or part of the data base sets
- Listing of Error Diagnostic Message Set

g. Interfaces. The DA Component accepts its control cards and raw data sets input through the facilities of the operating system (OS/9020). Outputs to the printer are spooled through HASP, and outputs to tape/disk are spooled through the I/O facilities of the OS/9020. Utility Modules in the RA Component are used to read, scan, and verify the input data stream; list Error Diagnostic Message Set; and output the messages on a specified device. The OS/9020 System Sort utility is used to sort given data sets. The subsets of the Data Base Management Subsystem utility components are used

for accessing and updating the data base sets. As DA is an off-line program which runs under OS, monitor interface modules used by the DB Subsystem are replaced by off-line versions of the executive modules, and on-line DB validation and lock-list manager modules are replaced by stubs.

2.2.2.2.2.1 DA-PRCN Process Control Cards Component

a. Purpose. The purpose of the Process Control Cards (DA-PRCN) Component is to read, scan, list, and validate the Program Control Cards Set and to set control values in the Interface Control Table Set.

b. Functional Description. The Program Control Cards Set is read, scanned, and decoded by using the utility modules in the RA Component, and then listed and verified. User identification and password are validated against values contained in the Authorization Table Set. If an error is detected, then an error message containing the appropriate diagnostic message, the input data, and an asterisk (*) indicating the position where the error is detected is listed. If no errors are found, then, in the create mode, proper data set creation order will be maintained by using the data set ordering sequence contained in the Table Ordering Table Set. In update mode, it will be determined whether the specified change will affect other data base sets by using the dependency data contained in the Table Dependency Table Set. If other data sets are affected, then the proper information message will be listed. The Interface Control Table Set is initialized with the control values needed in controlling processing of all other components of the DA Component. During processing of control cards, the first error detected on any control card causes that

card to be discarded and, if no list data set name has been provided by the user, the DA Component processing is aborted with an appropriate user code.

c. Input. The DA-PRCN Component has the following inputs;

- Program Control Cards Set
- Control Card Verification Table Set
- Authorization Table Set
- Table Dependency Table Set
- Table Ordering Table Set

d. Output. The DA-PRCN Component has the following outputs;

- Interface Control Table Set containing control information for other components
- Error Diagnostic Message Set listing

2.2.2.2.2.2 DA-CRUP, Create/Update Component

a. Purpose. The purpose of the Create/Update (DA-CRUP) Component is to create new data base sets, to merge the input OAG flight records with the existing OAG Flight Record Set, to update the existing data base sets, or to clean the existing OAG or non-OAG Flight Record Sets.

b. Functional Description. DA-CRUP provides for reading, scanning, validating, converting, and formatting raw input data record sets; creating new data base sets; merging the input OAG flight records with the existing OF; cleaning the existing OF or NF data base sets; and updating the existing data base sets by adding, changing, or deleting data records using utility components of the Data Base Management Subsystem. DA-CRUP consists of five major subcomponents as described on the following pages.

The flow through DA-GENUP is controlled by the DAGENU Module. For the add update option, DAGENU calls DB-CTBE to add General Table Sets data record entries. For the change update option, DAGENU calls DB-TABT to retrieve the specified data record entry to be changed; appropriate modification to the record is made, and then DB-SETO is called to make the permanent record change. For the delete update option, either DB-SETO is called to delete the specified data record entries from the specified General Table Sets, or DB-DTAB is called to delete an entire General Table Set entry from the TZ. In all update types, DAGENU calls DA-LIST to list the updated portion of the data base record, if requested, and, if data base access errors are detected, then RA-ERRMSG is called to list the appropriate diagnostic messages.

c. Input. The inputs to the Create/Update Component include the following:

- Interface Control Table Set
- Raw Input Data Sets
- Data Set Description Set
- Verification Data Table Set
- Data Base Record Description Set
- OAG Record Description Set
- Existing data base

d. Output. The outputs of the Create/Update Component consist of the following:

- New or updated data base sets
- Error diagnostic message set listing

1. Control Component (DA-CNTR). The driver module (DACUDR) accesses the Interface Control Table Set to determine the table set type to be created or updated, opens and closes input data sets and links to the corresponding control module. This (linked to) control module controls the flow through the other four major subcomponents. DA-INP is entered to process user-supplied input data sets. Then DA-CRET, DA-MERG, or DA-UPD is entered for creation, merging, or updating, respectively, of all table sets related to the given table type.

2. Process Input Component (DA-INP). DA-INP consists of two independent components: one (DA-GINP) processes the General Table Set and flight record update-related raw input data, while the other (DA-OAGINP) processes OAG tape input. Flow through the DA-OAGINP Component is controlled by the DAOAGI Module. DAOAGI links to DARED to read the input OAG flight records; DAFILN for filtering out non-flight records; DA-LIST to list the input OAG flight record images if the input list option is specified by the user; DA-OAGVR for validating correct syntax and values of appropriate data-items; DA-FORDR for converting flight records into data base record form; and DAWRT to write formatted data records to an intermediate data set.

   Flow through the DA-GINP Component is controlled by the DAGECO Module. DAGECO links to RAREAD to read the raw input data record sets for the General Table Set or the flight record set update; DA-LIST to list the raw input data record sets if the input list option is specified; DA-GENVR for decoding and validating keywords

and related data-item syntax and values; DA-FORGN for converting from external to internal form and for formatting converted input data sets into data base record form; and RA-SORT utility Component to interface with the OS/9020 System utility component, UT-SORT, for sorting formatted data records alphabetically in create mode only. The first error detected on any input raw data record, during validation or formatting, causes that logical input raw data record to be discarded.

3. Create Component (DA-CRET). DA-CRET consists of two independent components: DA-FLGCR and DA-GENCR, which create flight record related sets and General Table Sets, respectively.

Flow through the DA-FLGCR Component is controlled by the DAFLCO Module. DAFLCO links to DB-CTAB to initialize a flight record set and its related sets; DA-FATS to initialize the non-OAG Flight Accession Table Set XY for creating the NF Set; DA-ADTS to initialize either OAG or non-OAG Arrival/Departure Table Sets (OS or NS); RAREAD to read the sorted flight records passed from DA-OAGINP; DB-CFRS to insert flight records into the OF Set and to update the related index OS, YX, and IX data sets; DB-GETR to retrieve the NF data record block; DB-INST to insert flight records into the NF Set and update the related index data sets NS, XY, and XI; and RA-ERRMSG to write diagnostic messages if errors are encountered.

The DA-GENCR control module (DAGECR) calls DB-CTAB to initialize the table set header and to create a TZ entry; RAREAD to read

sorted data record images; DB-CTBE to add records to General Table Sets; RA-ERRMSG to list any diagnostic messages; and DB-DTAB to delete the data set entry from the TZ data set if errors are encountered in creating a specified data set.

4. Merge Component (DA-MERG). Flow through this component is controlled by the DAMERC Module. For OF or NF data set clean-up operation, DAMERC links to the DA-OFCL Component to discard deleted flight records from the existing OF Set and to sort valid records by the aircraft identification; to RAOPEN to open the sorted data record set; and to the DA-FLGCR Component to insert the flight records into the OF or NF data sets and to update related flight index sets.

For merging the new OAG tape data with the existing OF Set, DAMERC links to the DA-OAGINP Component to read, decode, validate, and format the new input OAG tape data records; the DA-OFCL Component to discard deleted records from the existing OF Set and to sort valid records by the aircraft identification; and to the DA-MRGE Component to compare the new and existing flight records. New and existing flight records are considered duplicates if arrival and departure airports, aircraft type, class, category, and identification are equal and the difference between old and new departure times and between old and new enroute times are within the predefined time limits. When duplicate records are found, then only the new flight record is kept; otherwise, both old and new flight records are kept. After all valid flight records are collected, the DA-FLGCR

Component is called to reinitialize the OF Flight Record Set and its related HS, IX, YX, and OS sets, to insert valid flight records into the OF Set, and to update the related HS, IX, YX, and OS sets.

5. Update Component (DA-UPD). DA-UPD consists of two independent components: DA-FLGUP is used to update flight record sets, while DA-GENUP is used to update General Table Sets. Data Base Management Subsystem utility components are used to add, change, or delete data records.

The DA-FLGUP control module (DAFLUP) links to other modules (components) to process updates to the flight record sets. DB-UPFR is used to add flight records. In the delete mode, DA-GTFR is used to retrieve the record(s) to be deleted; the status indicator is set to the deletion value, and then DB-UPFR is called to make the data base update. For deleting the OF or NF Sets, DB-DTAB is called to delete entries from the TZ Set.

In the change mode, DA-FRCG is called. DA-FRCG calls DA-GTFR to retrieve a specified flight record to be changed; the appropriate modification to the record is made. When the retrieval key is changed, DB-UPFR is called, first to delete the old flight record, and then to insert the newly changed record. Otherwise, DB-UPFR is called to make the permanent record change. If requested in add, change, or delete update options, DA-LIST is called to generate a listing of the updated flight record. RA-ERRMSG is called to print an error message if errors are detected during updating of any flight records.

2.2.2.2.2.3 DA-LIST, List Component

a. Purpose. The purpose of the List Component (DA-LIST) is to generate formatted listings of the specified CFC data base sets and to generate listings of the input control card images and data card images, if requested.

b. Functional Description. DA-LIST provides the capability to produce a formatted listing of any CFC data base set or specified data record entries therein. DA-LIST consists of a control module (DALICO) and a List Output Component (DA-LISL). If an input control or data card image is to be listed, DALICO calls RAWRIT to list it. If a CFC data base set is to be printed, in part or in full, DA-LISL is called.

Flow through DA-LISL is controlled by the DALISL Module. The cases of flight records, general CFC data sets, and individually updated records are handled separately. When records must first be retrieved from disk-resident sets, a call is made to DA-GTFR for flight records while DB-TABT is called for all other general CFC data base sets.

For each record to be listed, DALISL makes a separate call to DAFORT to convert data item values from internal to external form and from binary to EBCDIC and then formats them into the output report format.

Before any record is listed, a call is made to DA-LISP to list top-of-the-page headers and/or data headers when required. Pagination is also controlled by DA-LISP.

If errors are detected in any data base operations, RA-ERRMSG is called to write the appropriate error diagnostic messages.

c. Input. Inputs to the DA-LIST Component consist of the following:

- Interface Control Table Set
- Header Format Table Set
- Data Base Record Description Set
- Existing data base sets
- Data buffer set containing either input program control cards set, raw input data set, or updated data record set

d. Output. Output from the DA-LIST Component consists of the following:

- Formatted data base record/sets listing
- Input control and data set listing
- Error diagnostic message set listing

The Visual Table of Contents for the DA Component is shown in Figure 2.2.2-9.

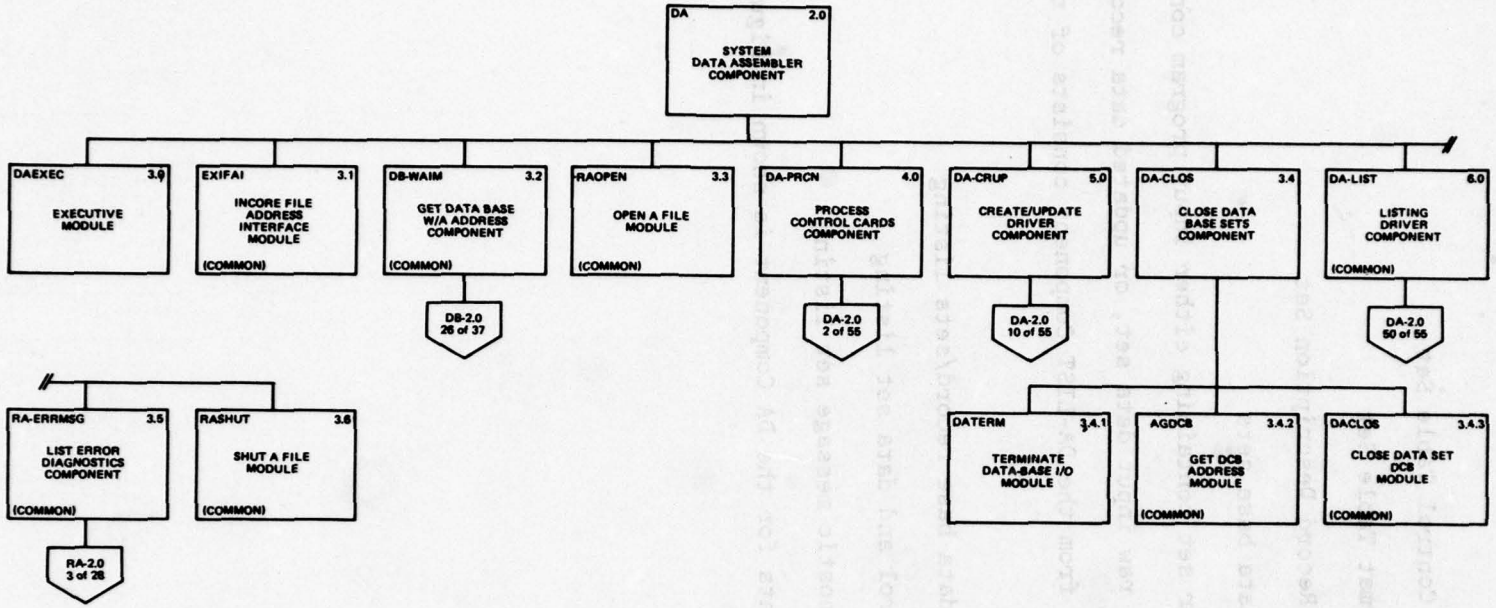


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (1 of 55)

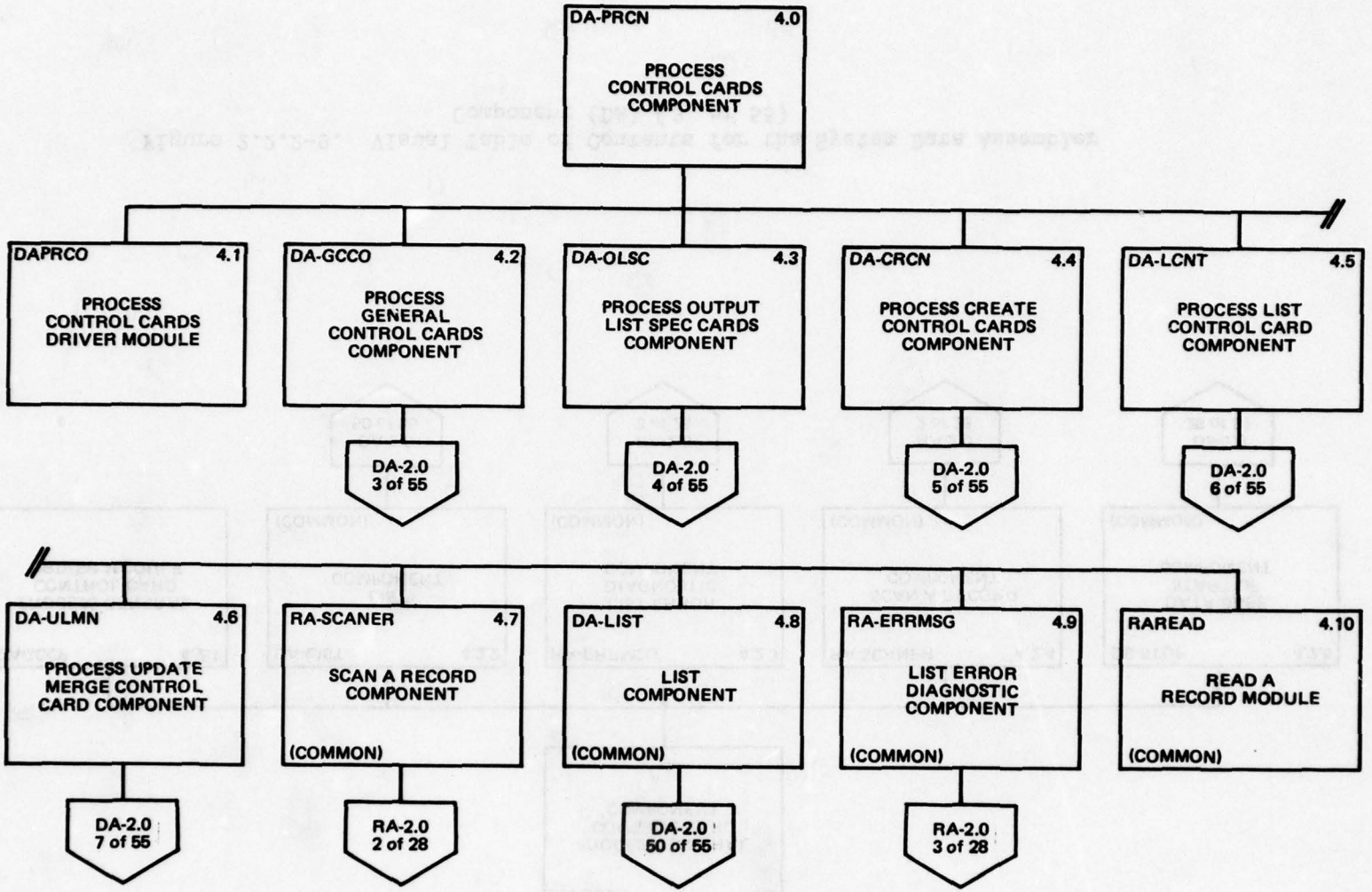


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (2 of 55)

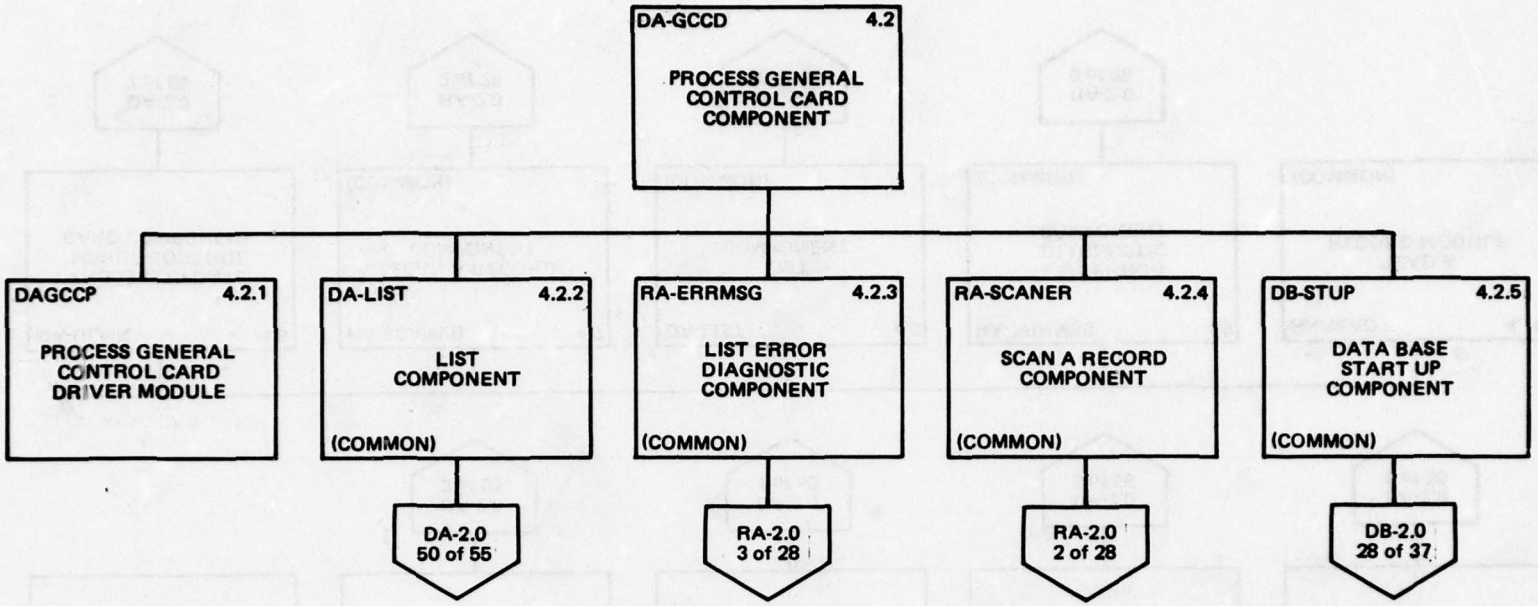


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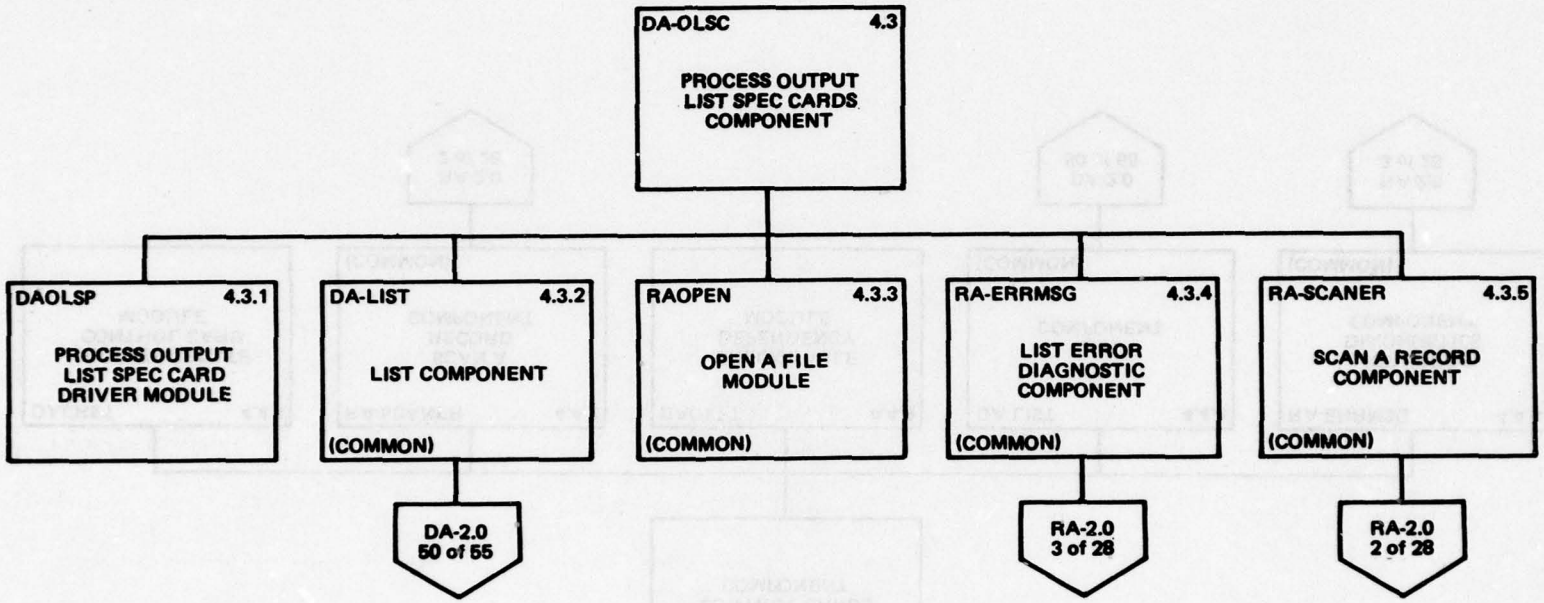


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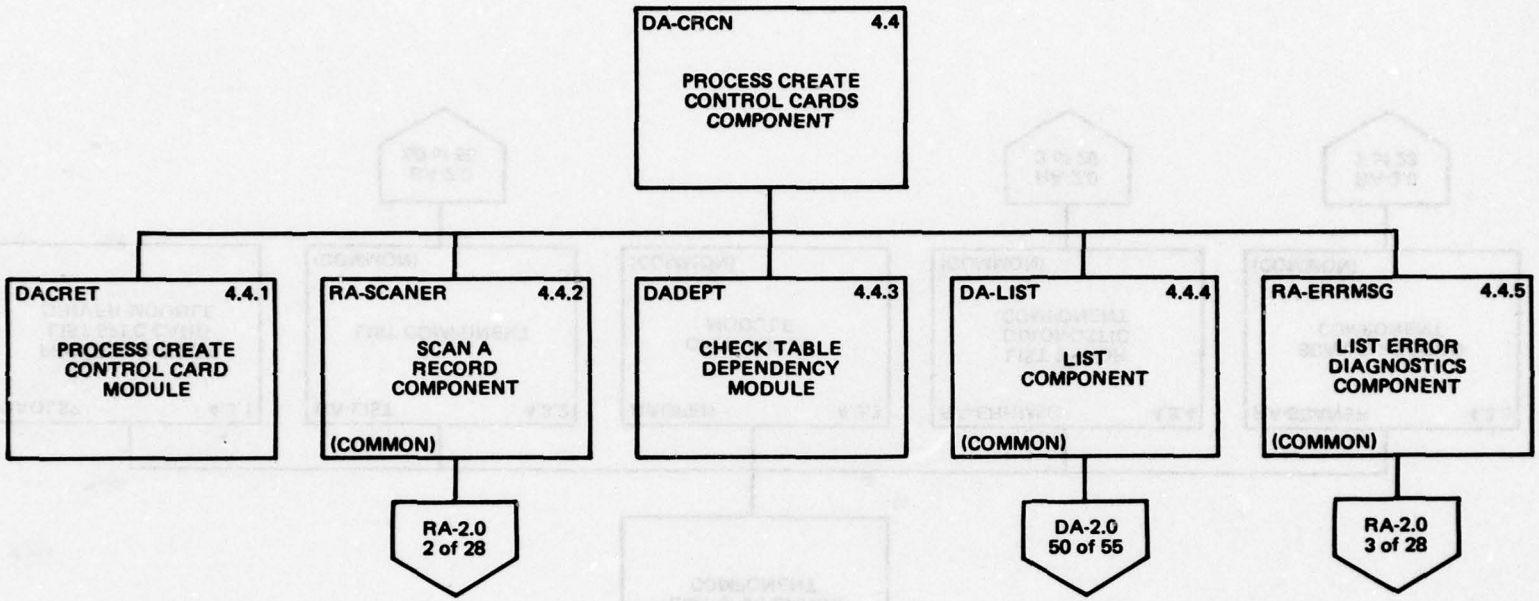


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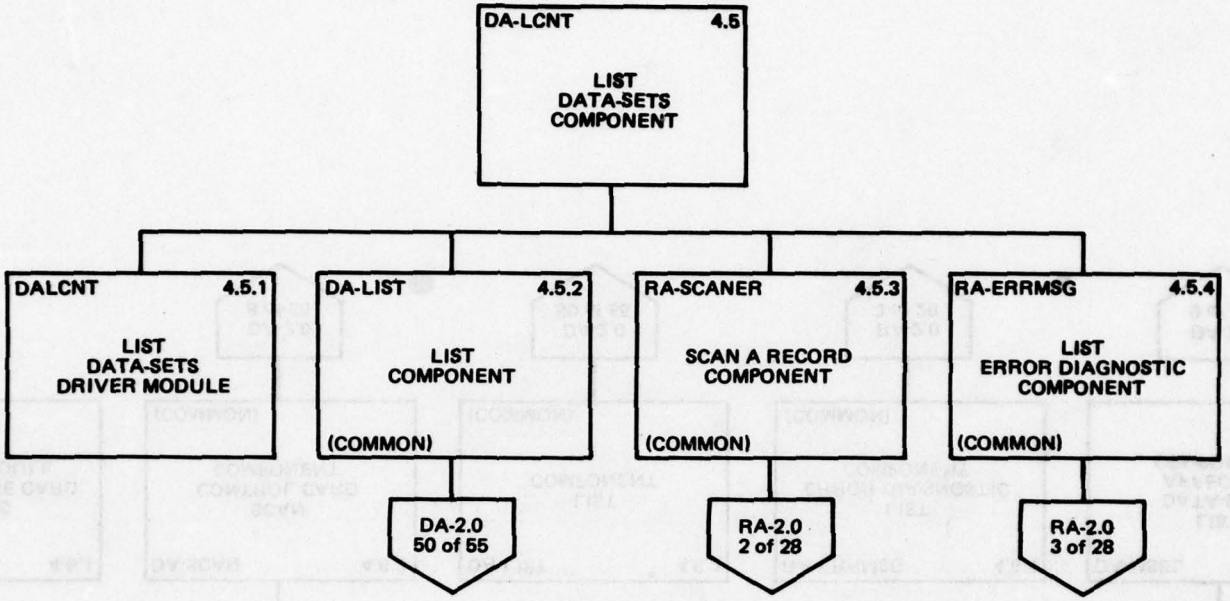


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (6 of 55)

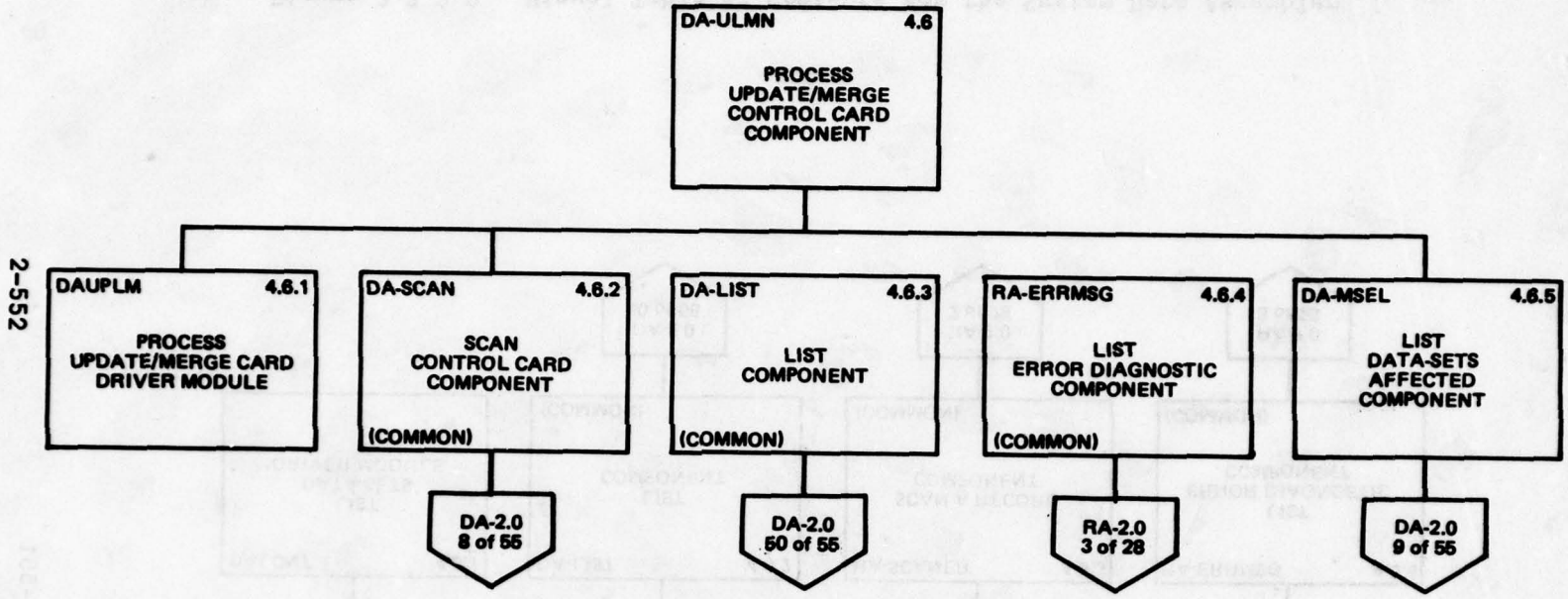


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (7 of 55)

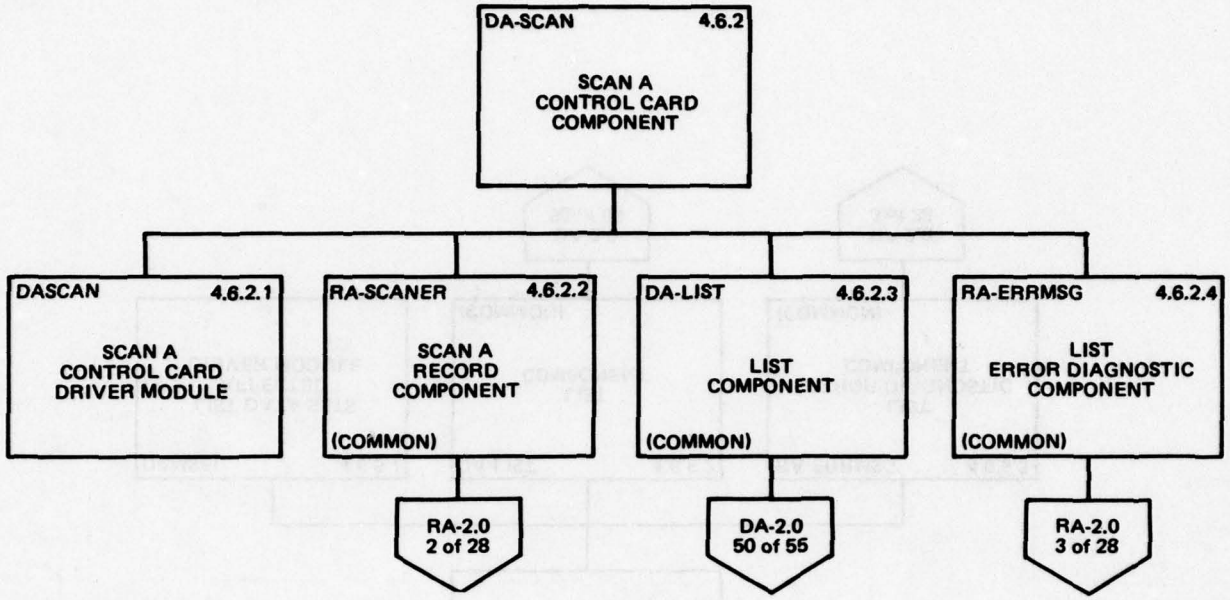


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (8 of 55)

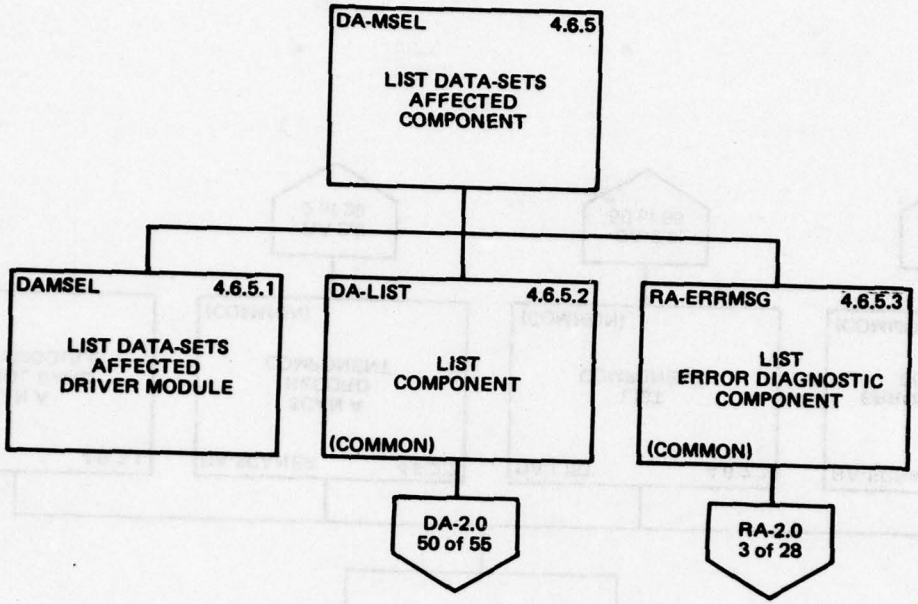


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (9 of 55)

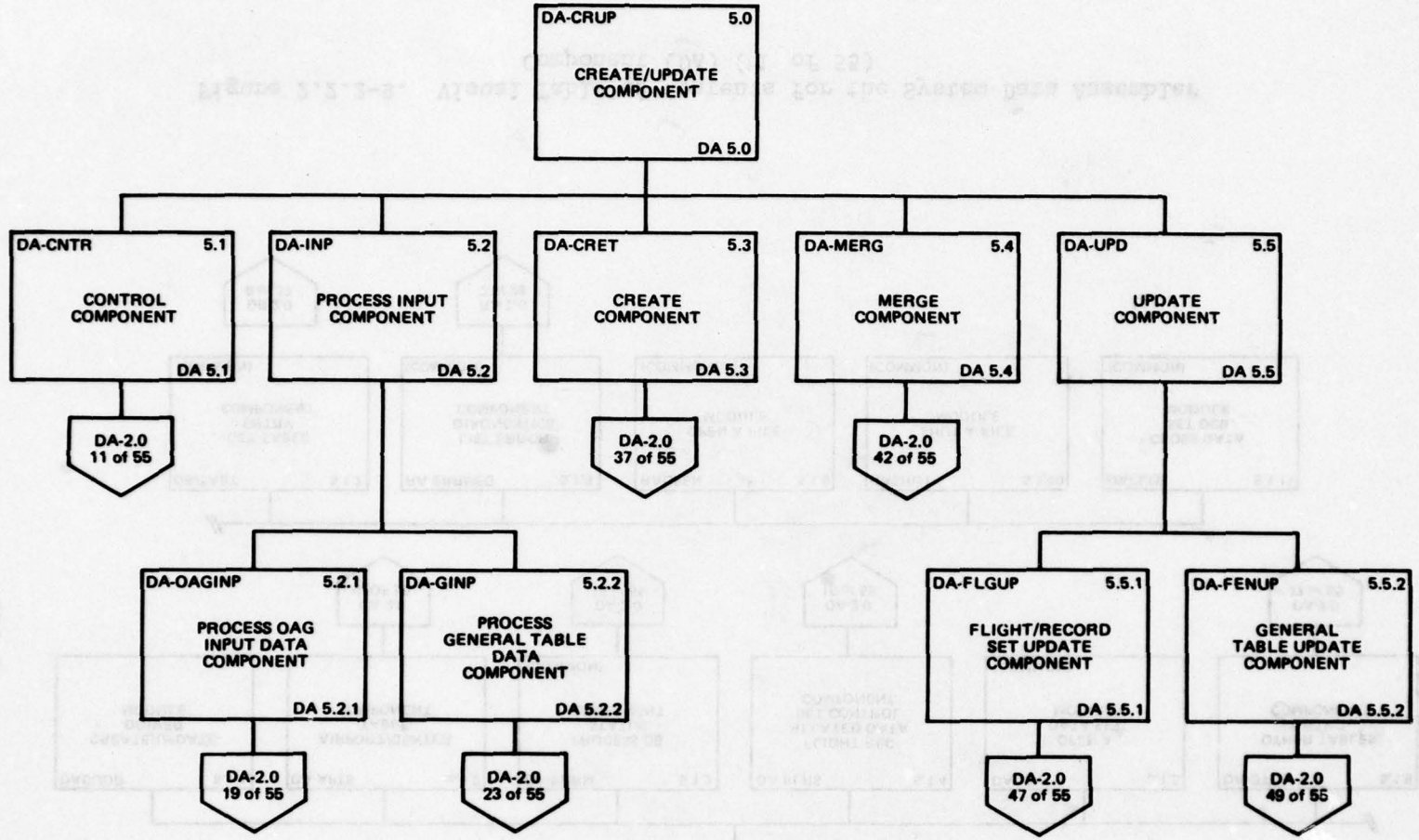


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (10 of 55)

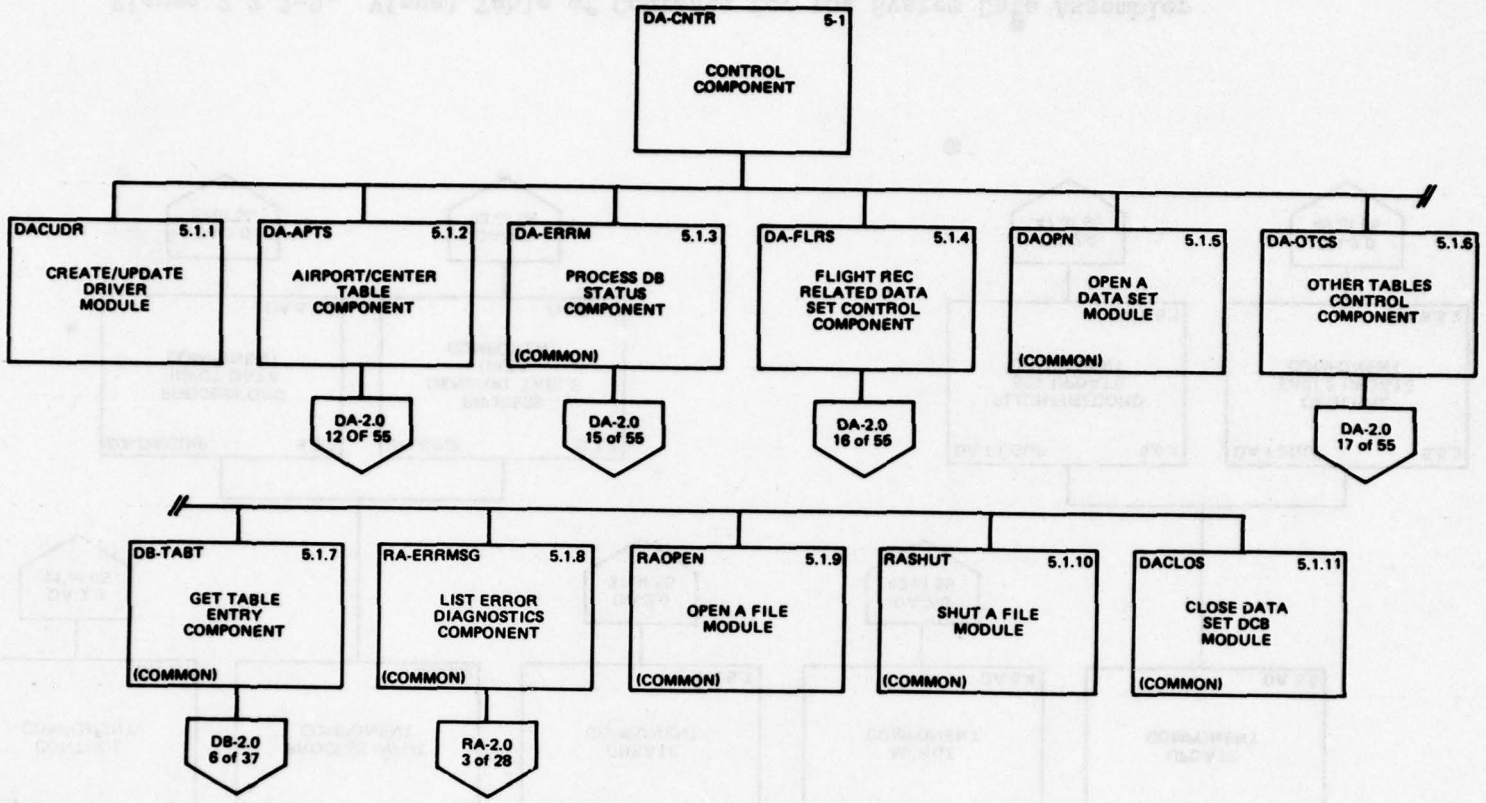


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (11 of 55)

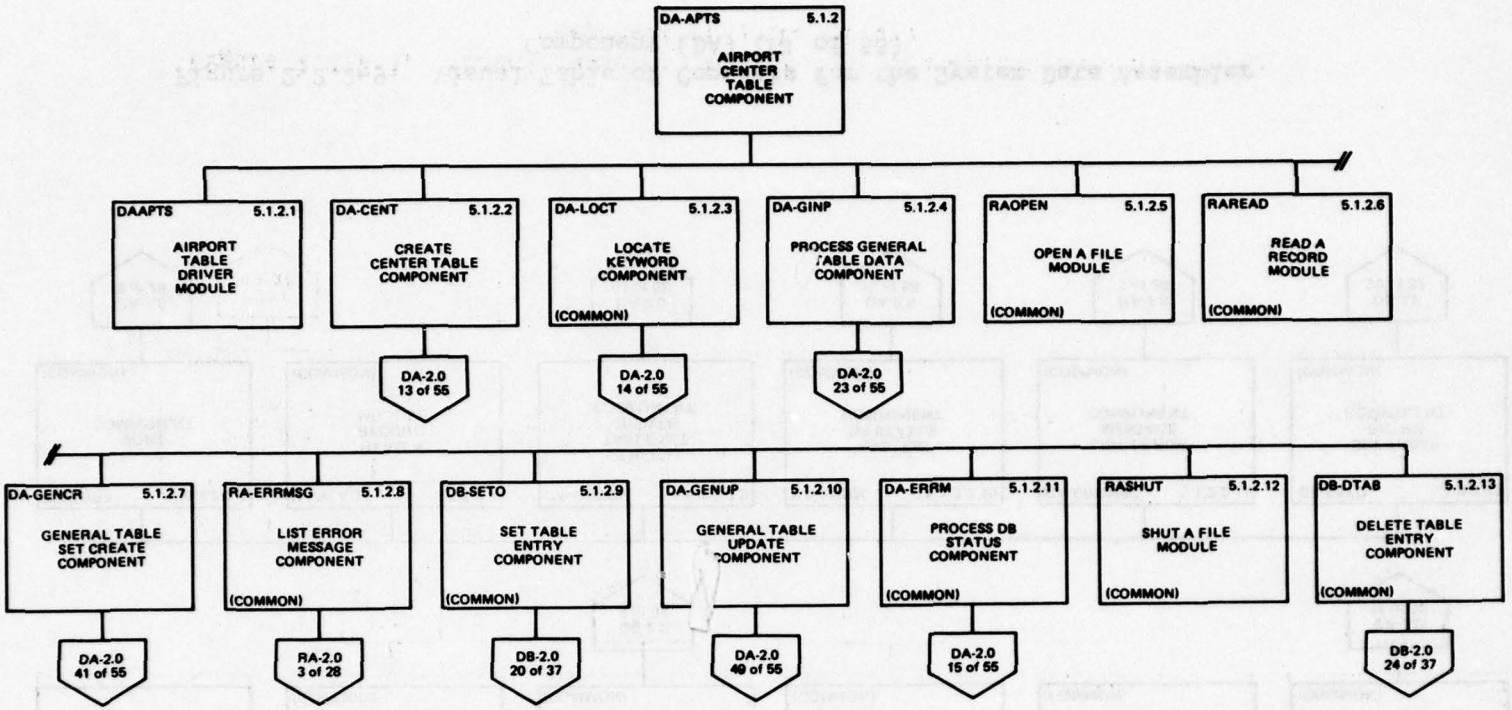


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (12 of 55)

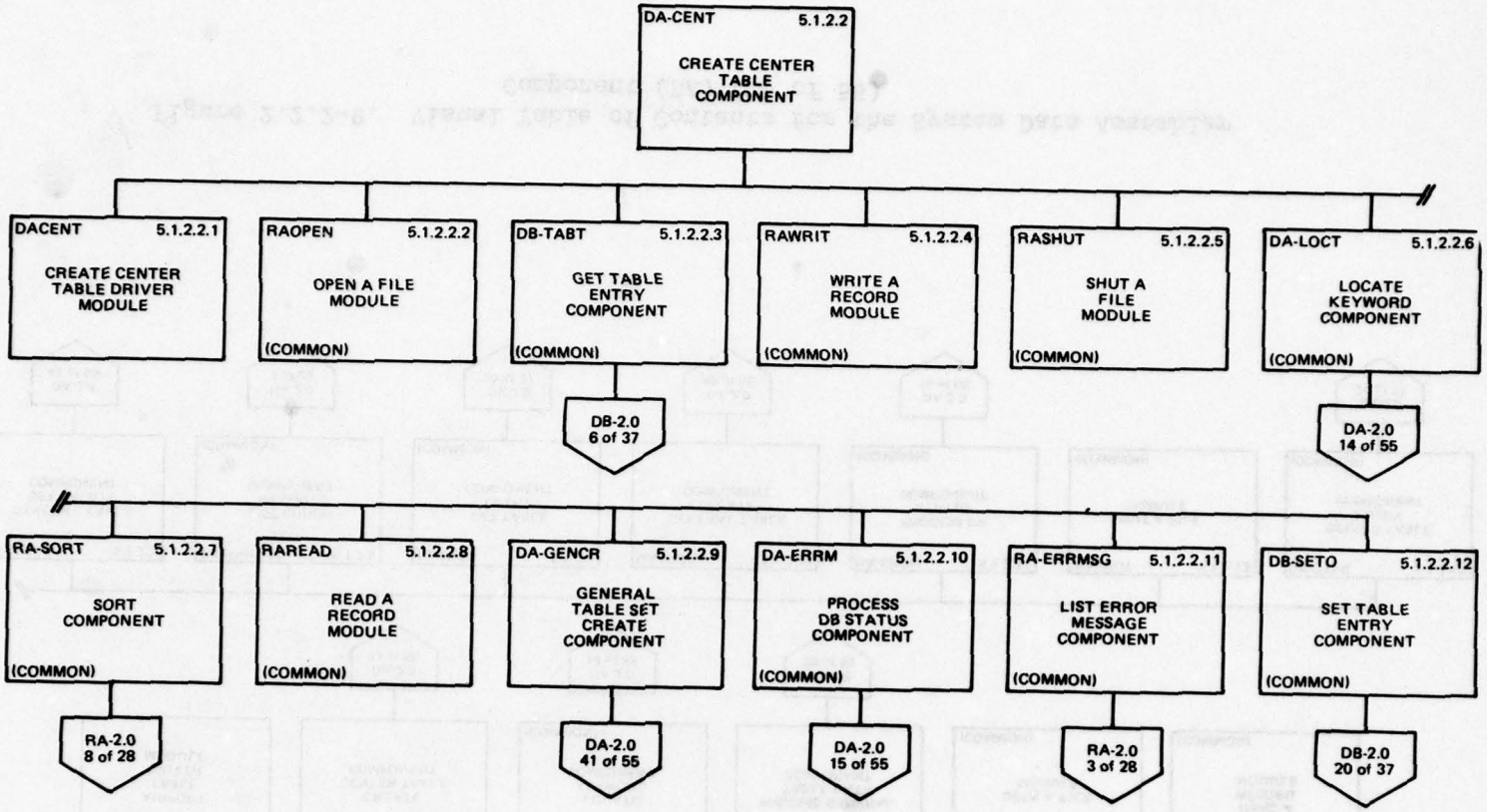


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (13 of 55)

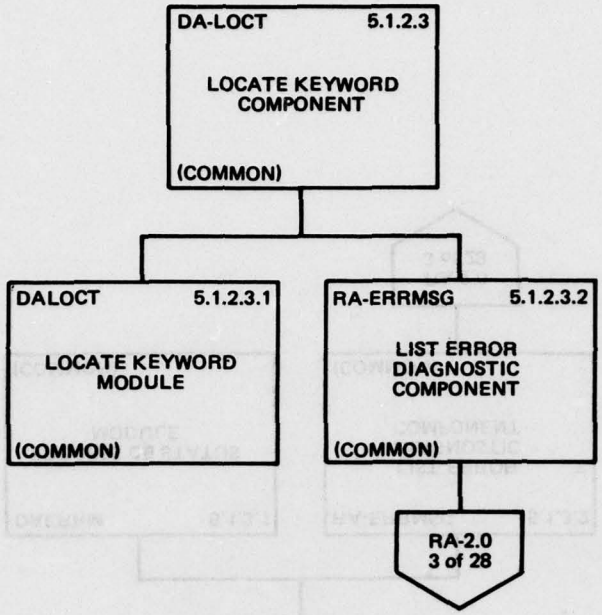


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (14 of 55)

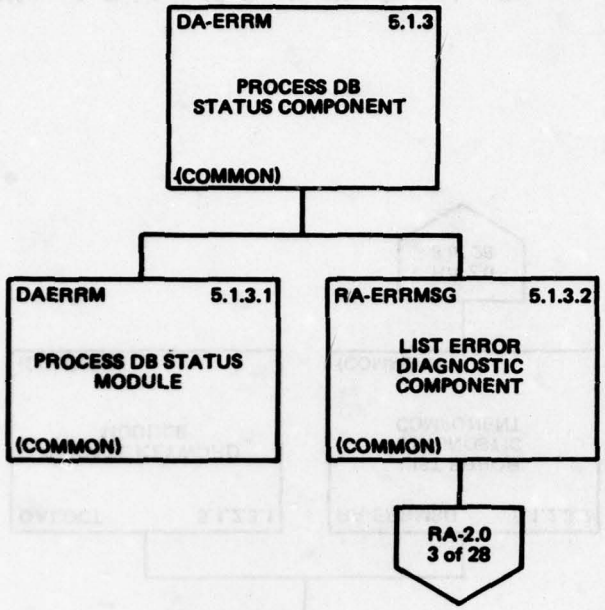


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (15 of 55)

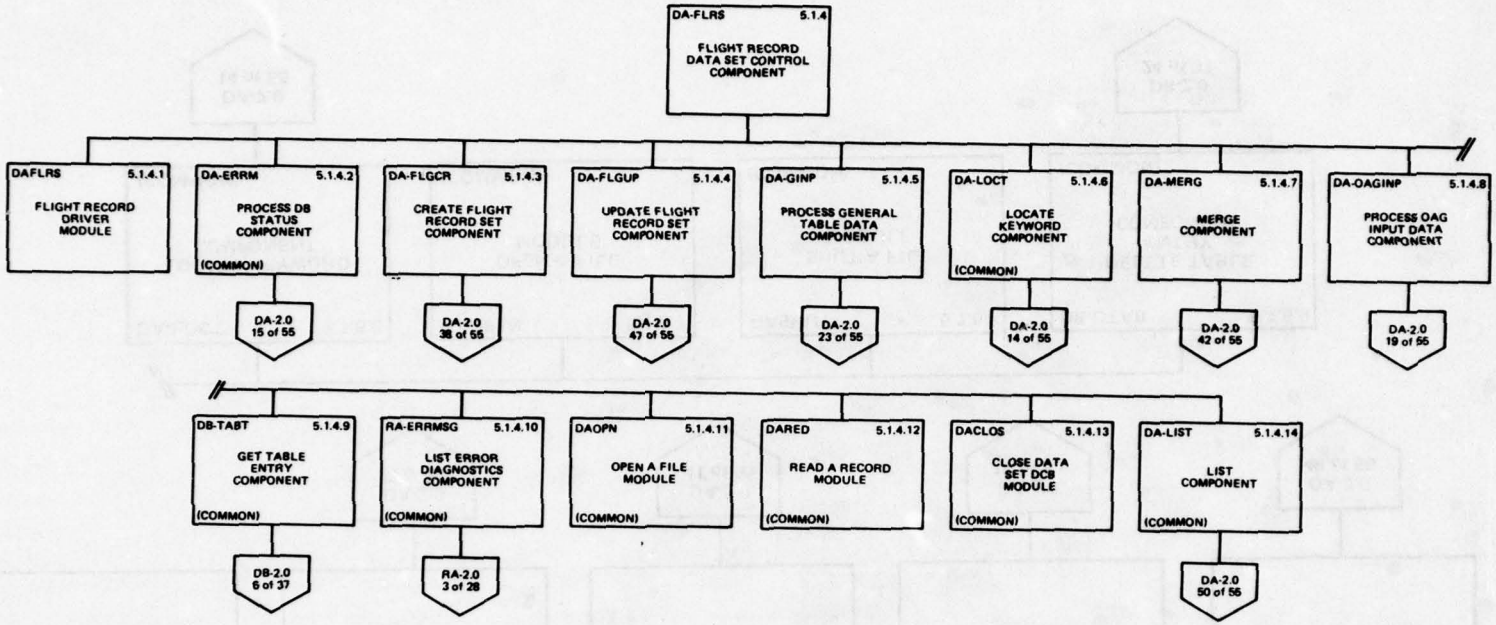


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (16 of 55)

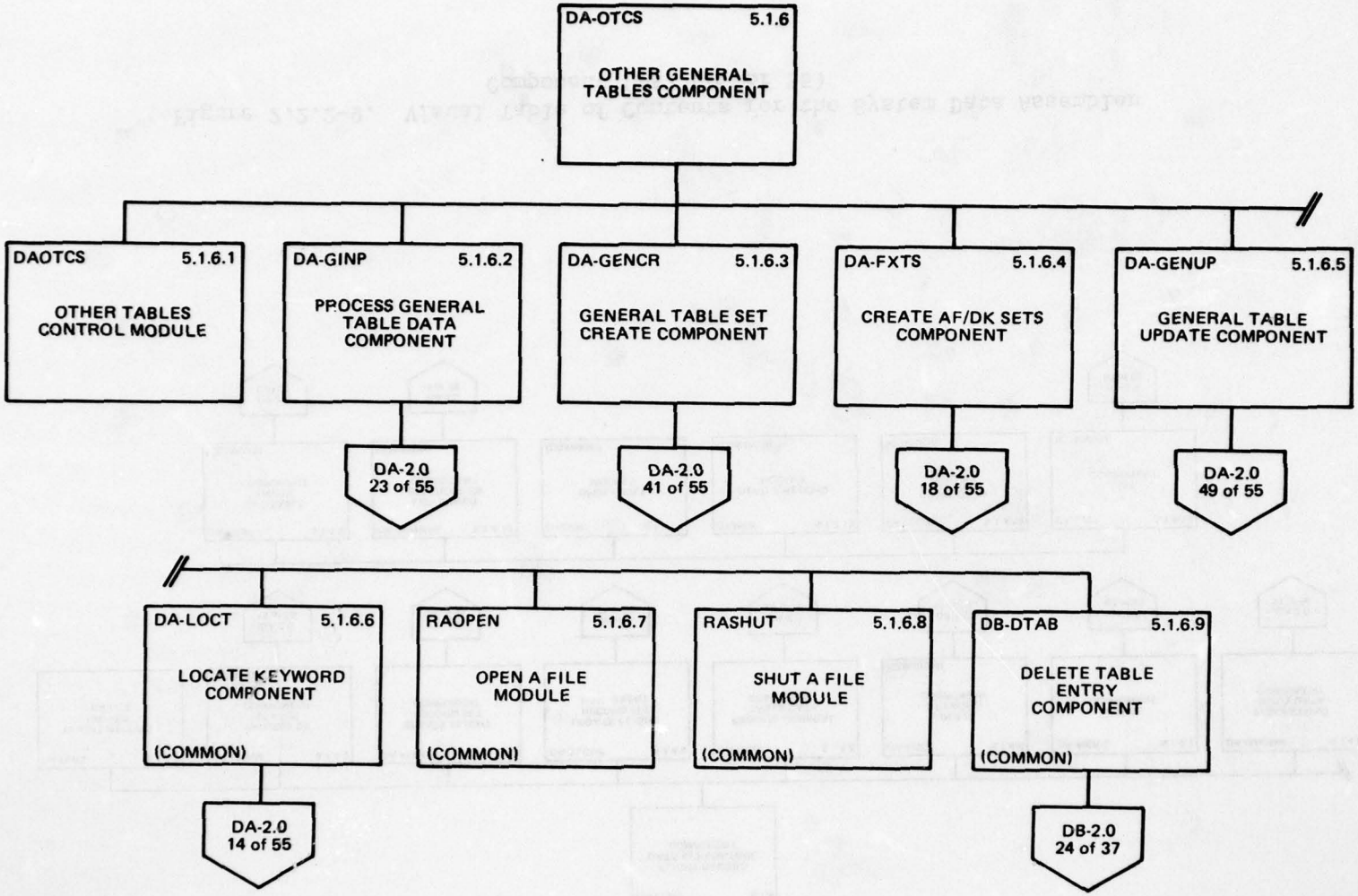


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (17 of 55)

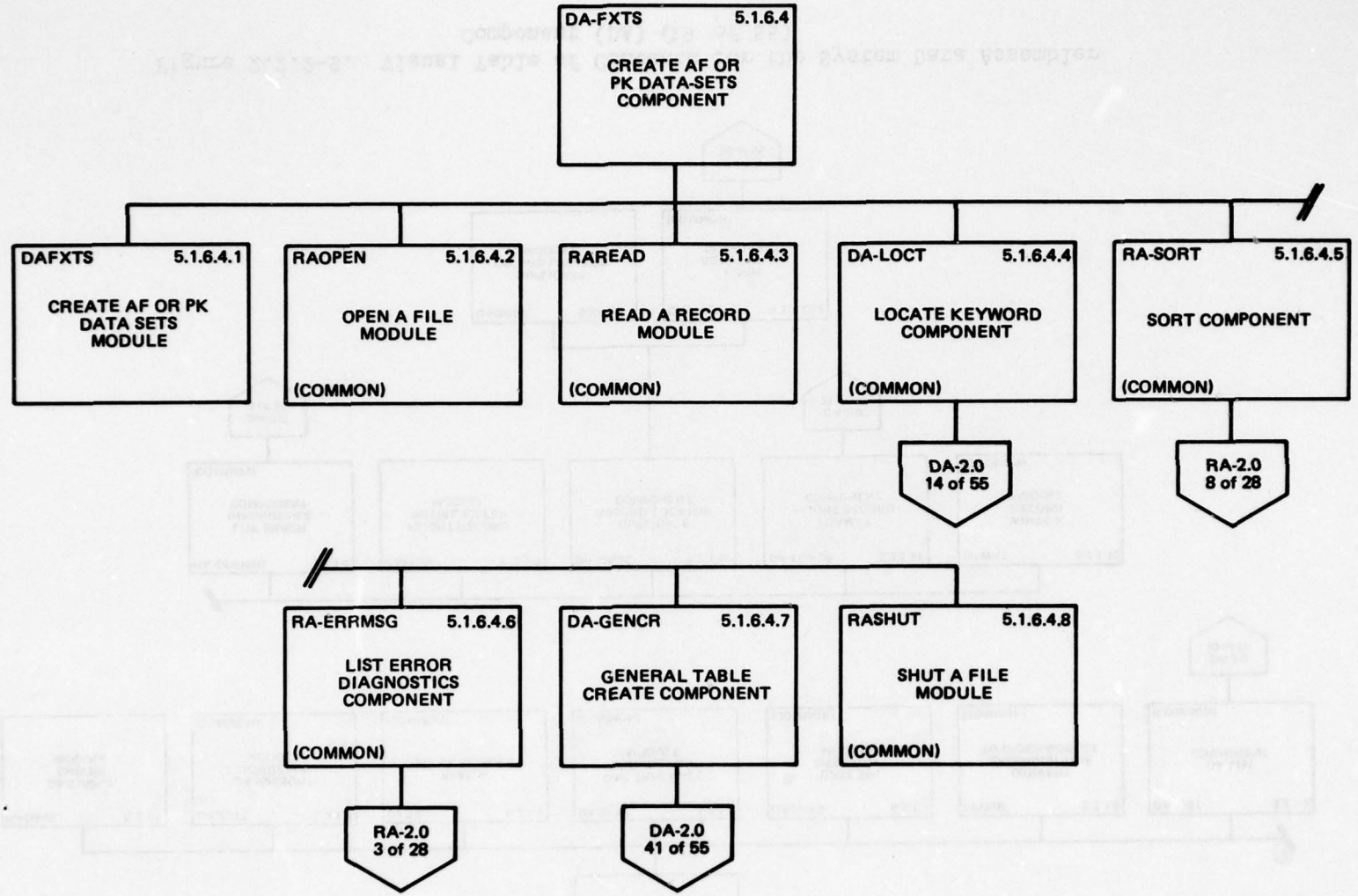


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (18 of 55)

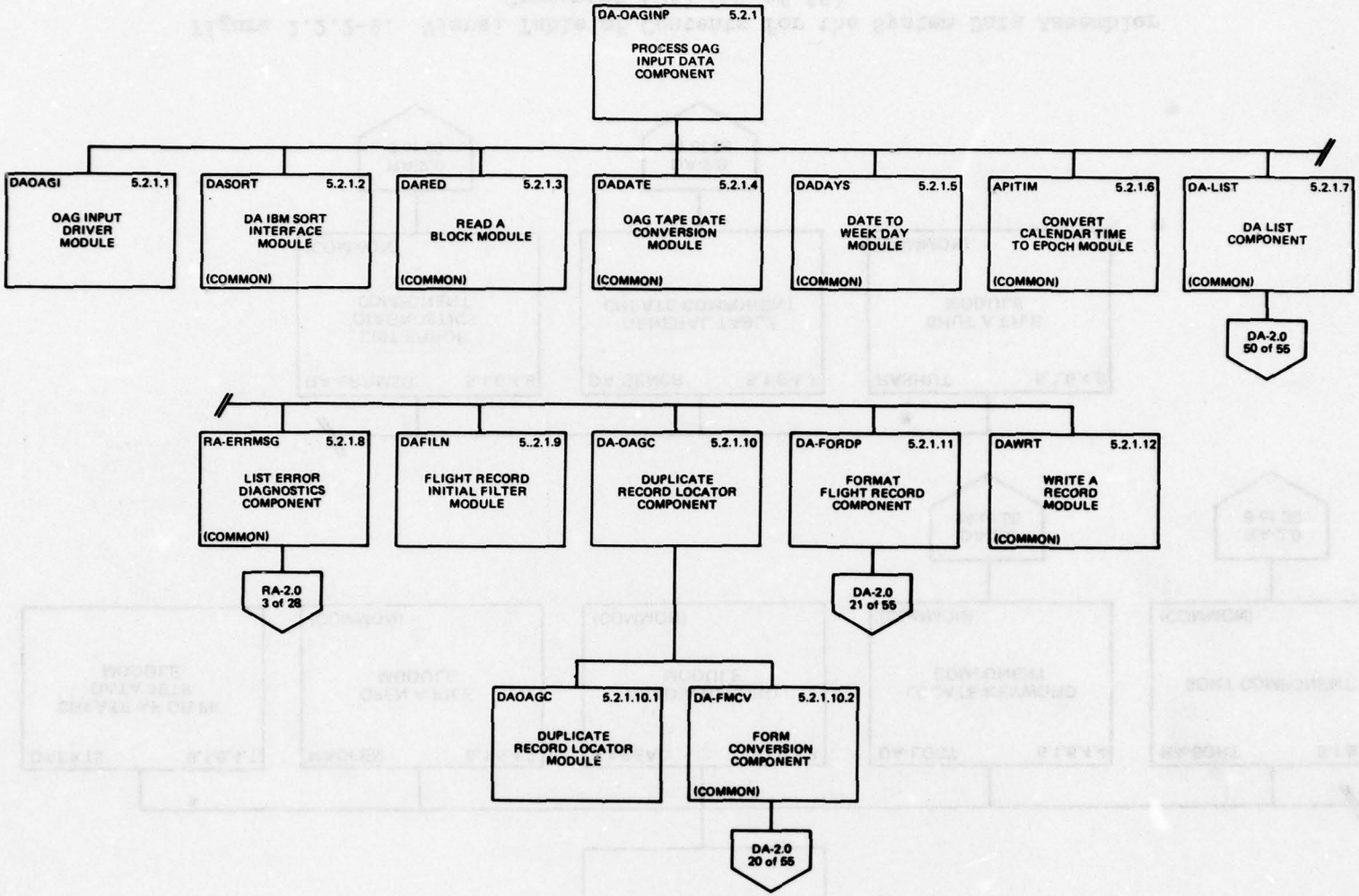


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (19 of 55)

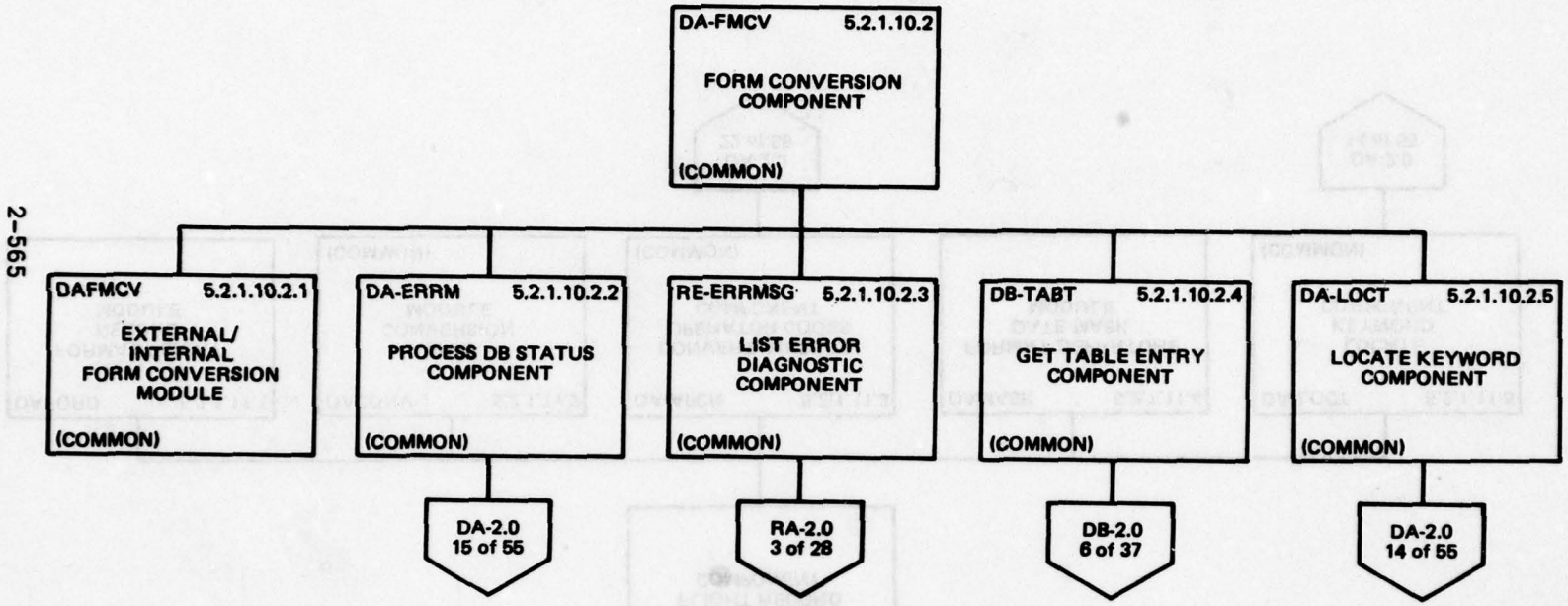


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (20 of 55)

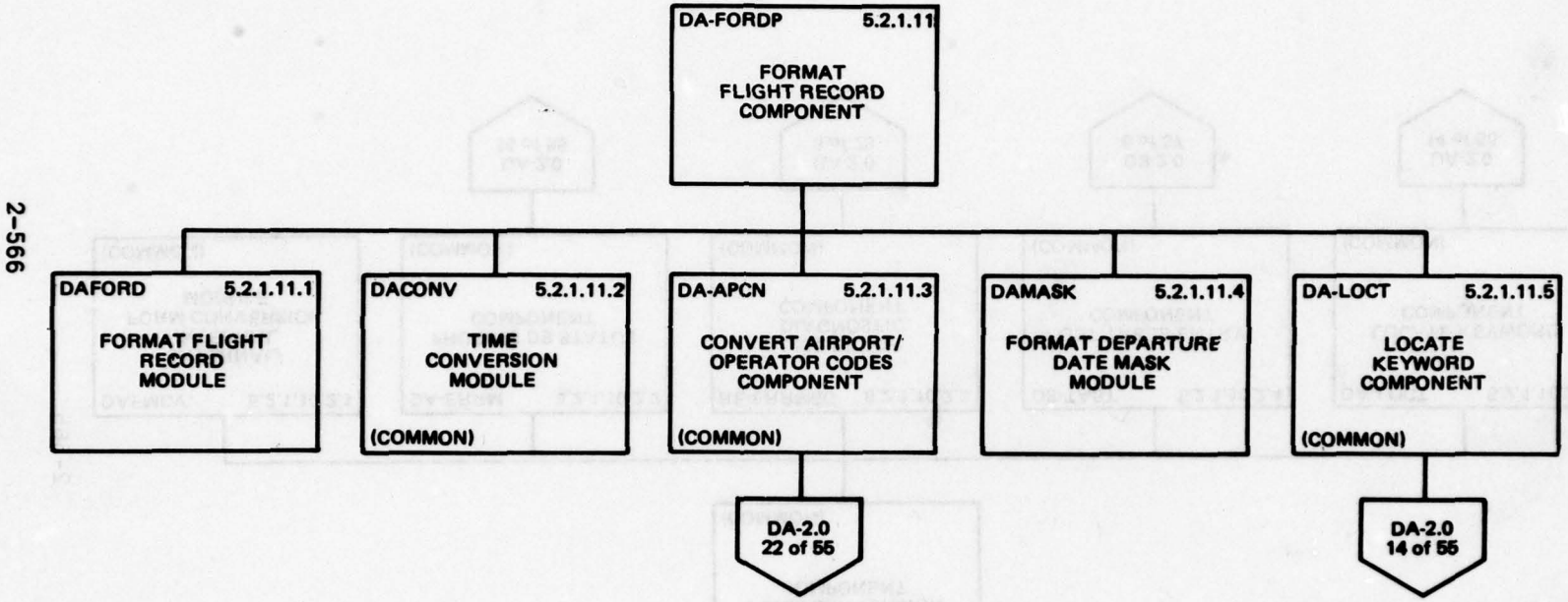


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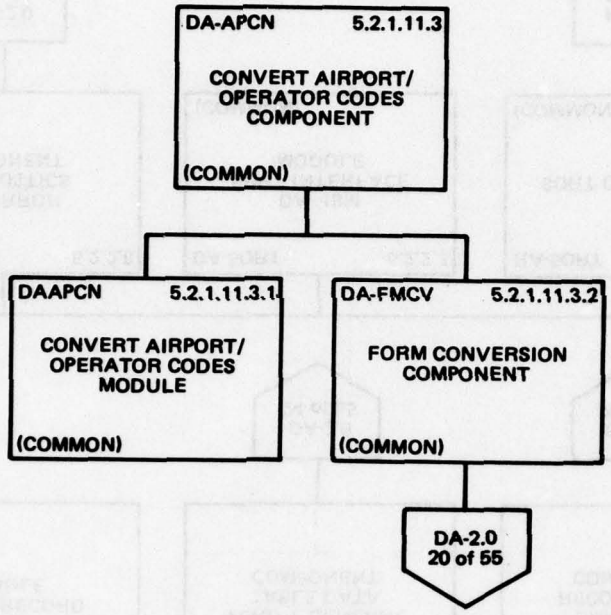


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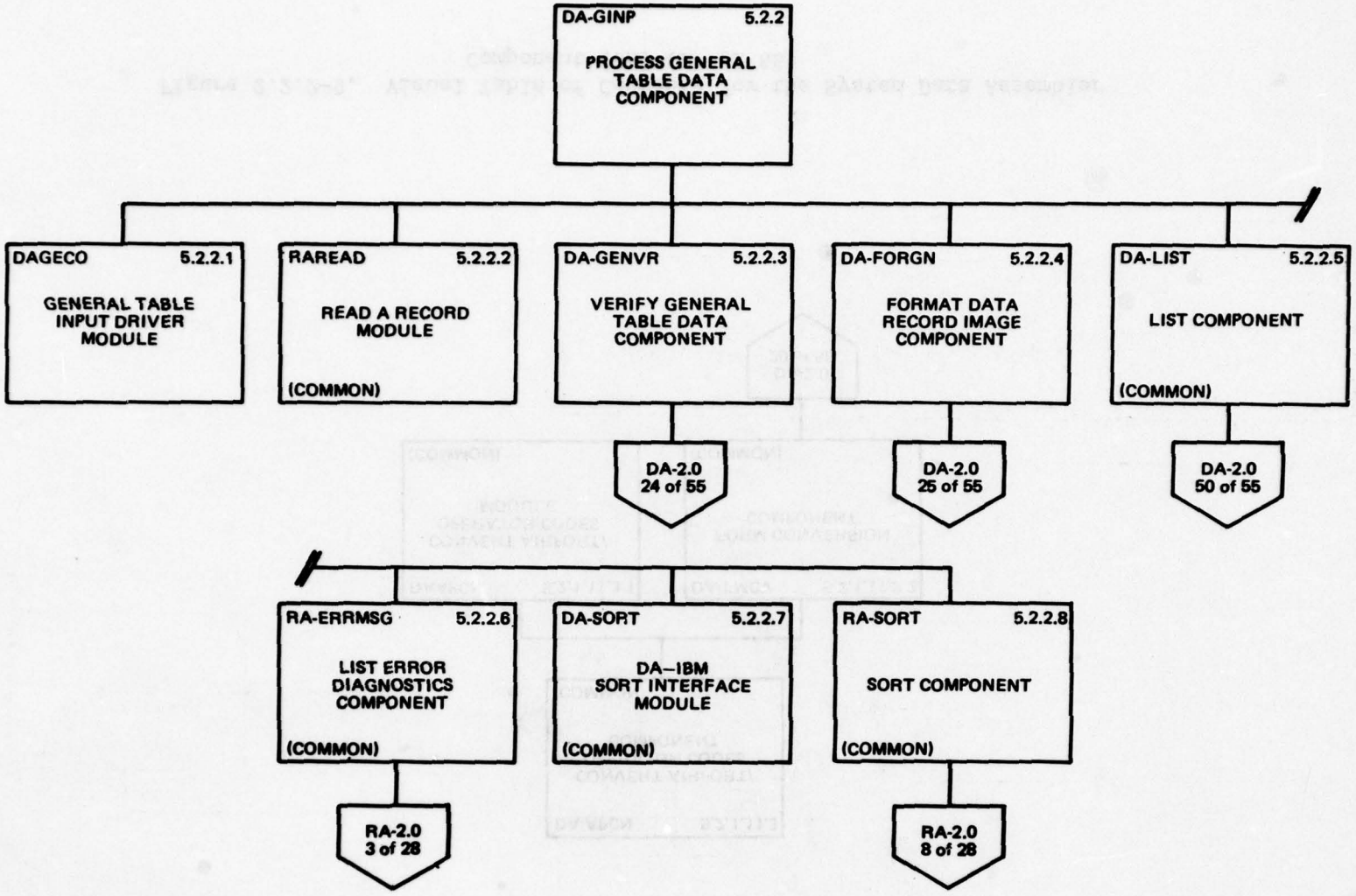


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (23 of 55)

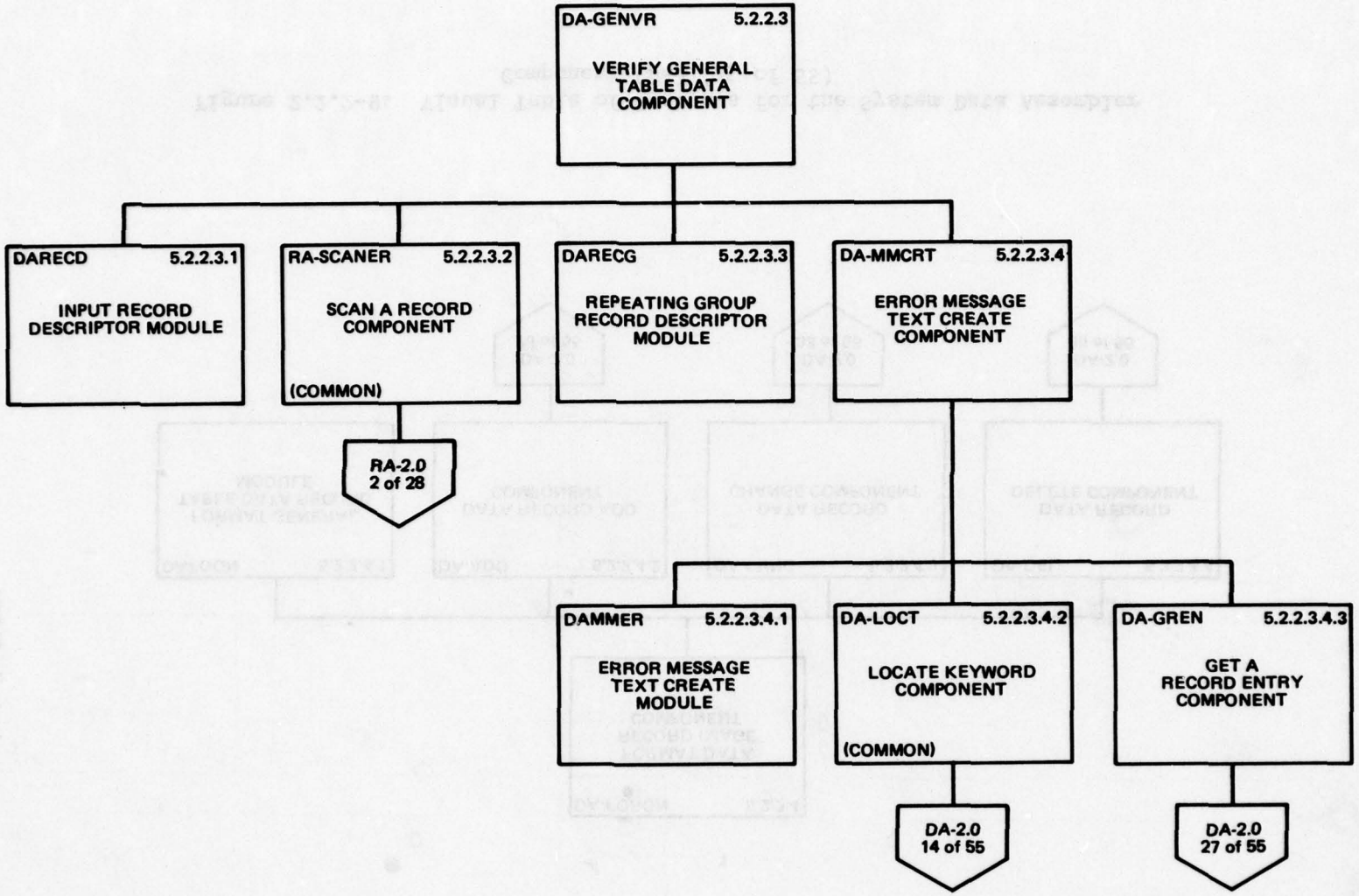


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (24 of 55)

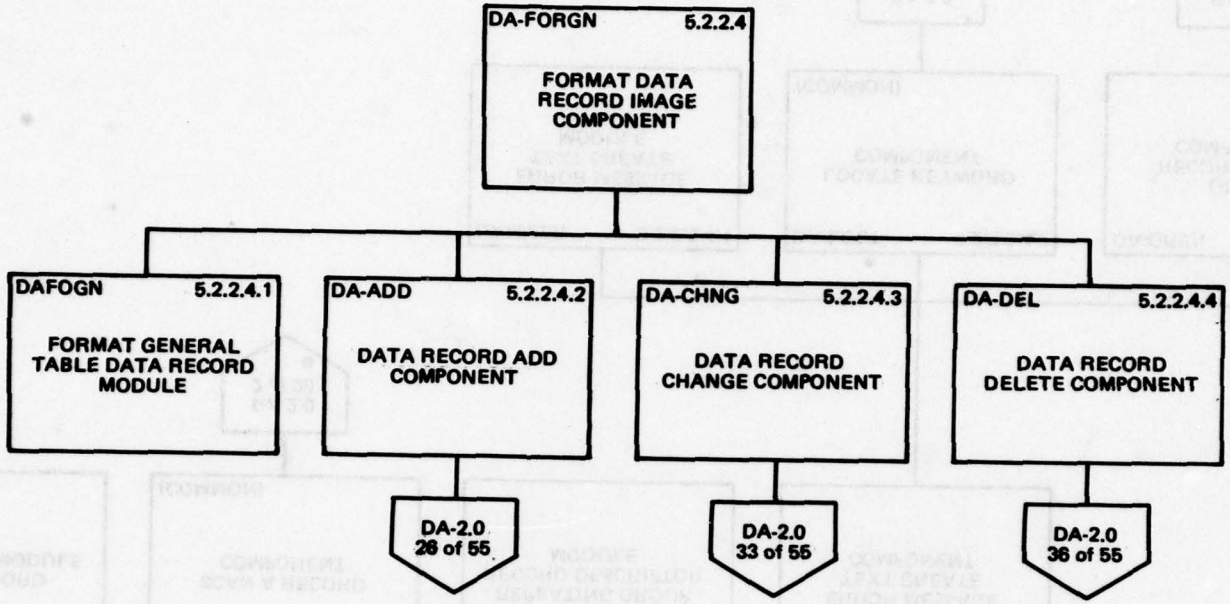


Figure 2.2.2-9: Visual Table of Contents for the System Data Assembler Component (DA) (25 of 55)

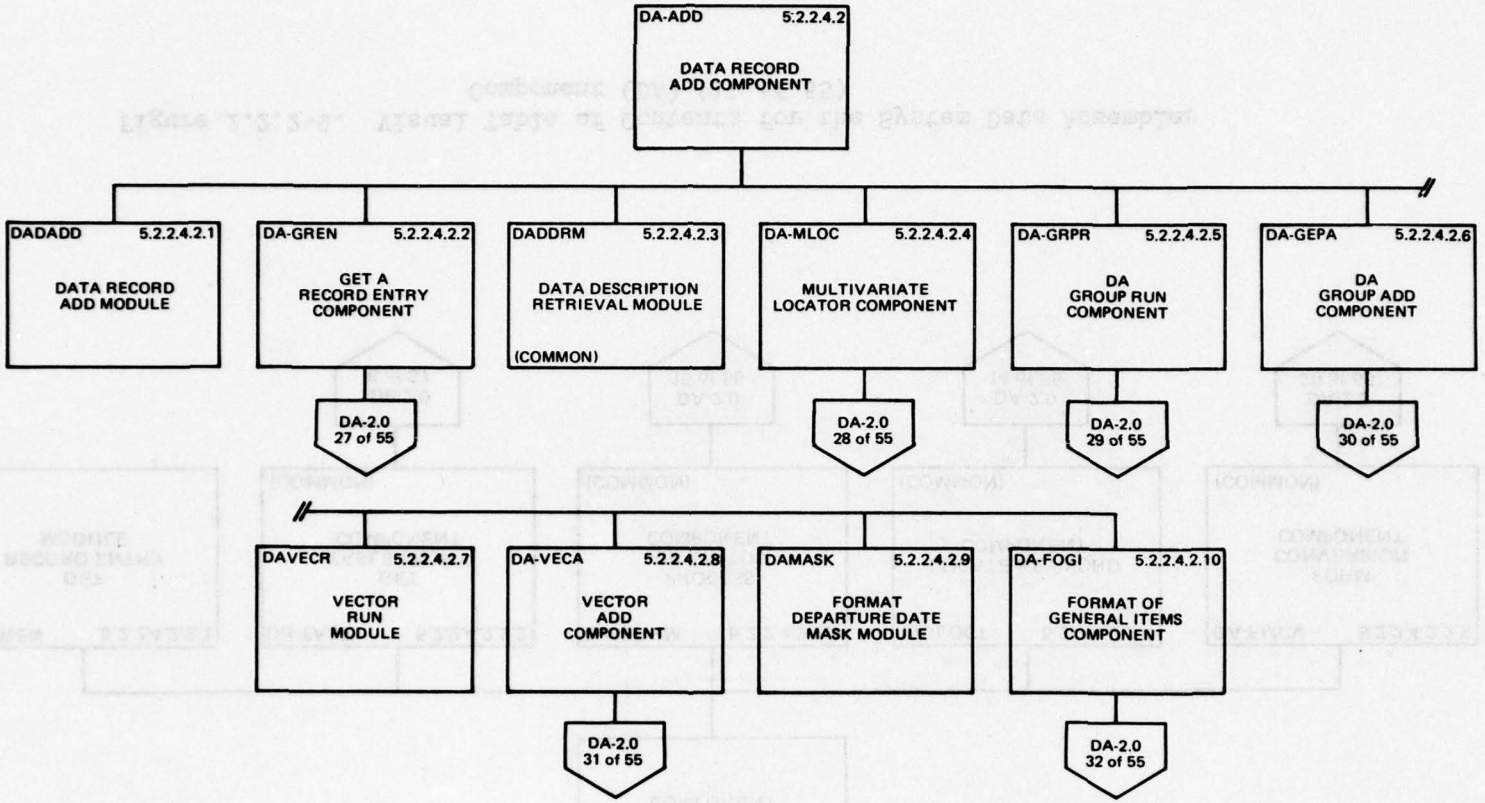


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (26 of 55)

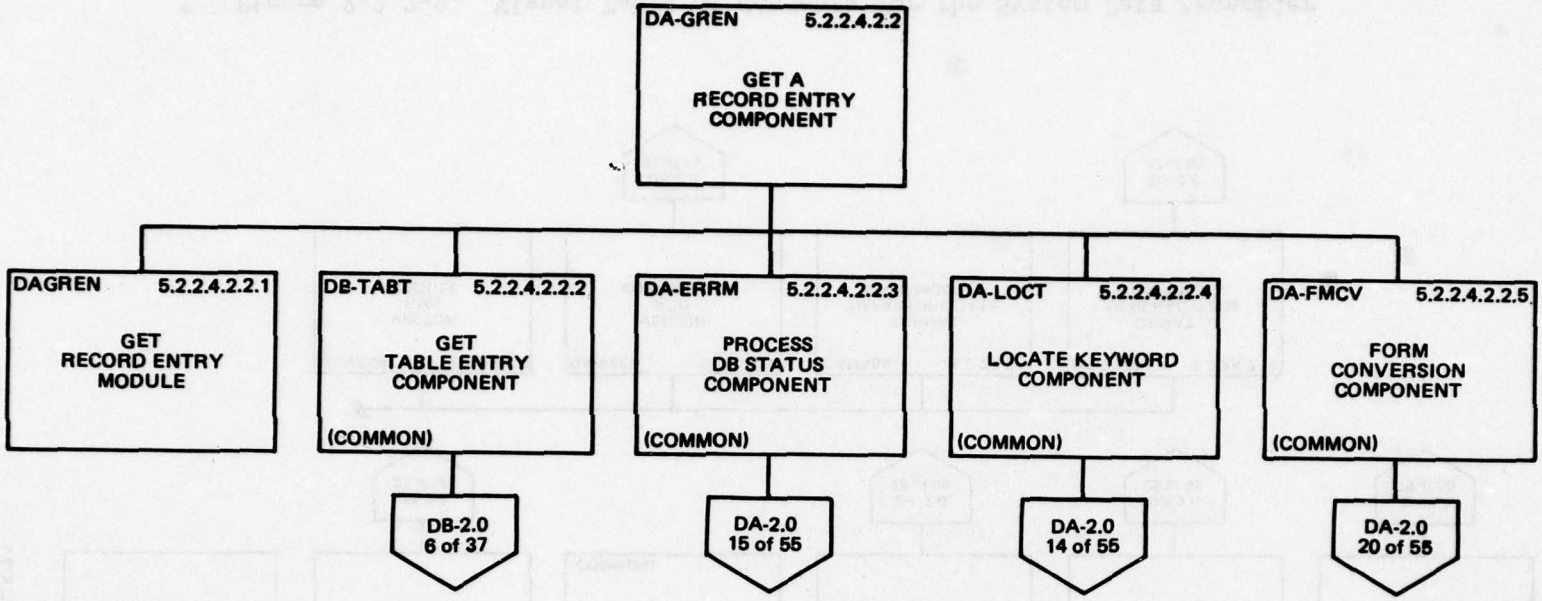


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (27 of 55)

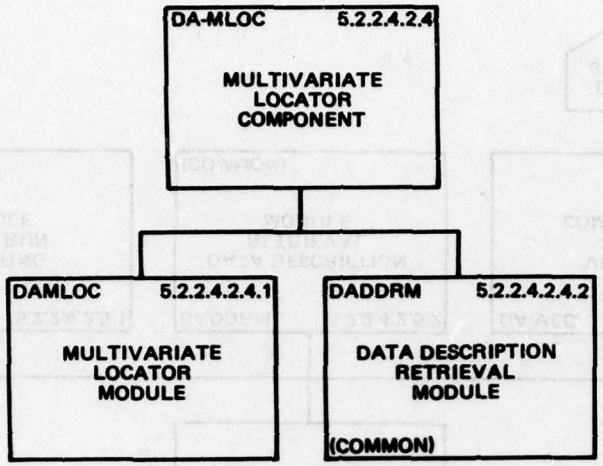


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (28 of 55)

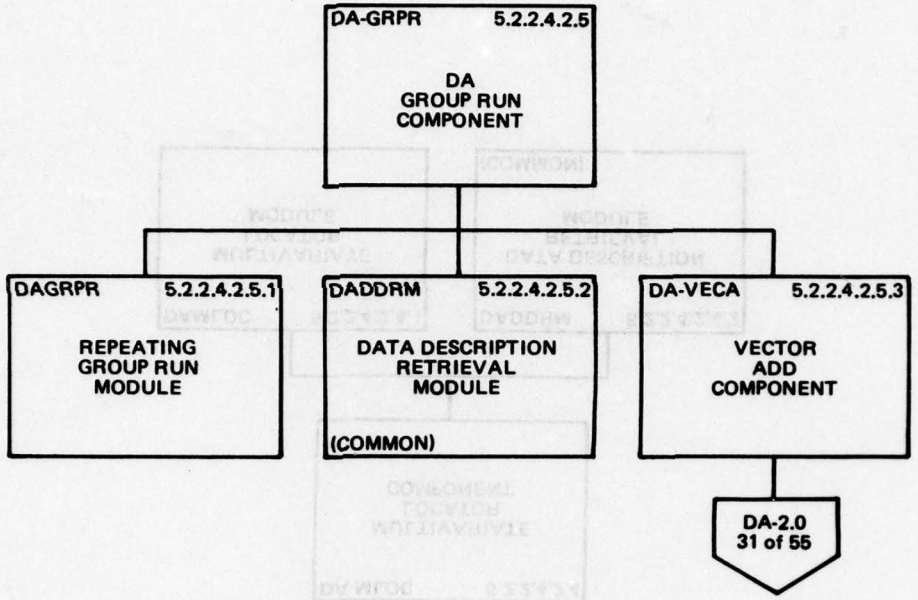


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (29 of 55)

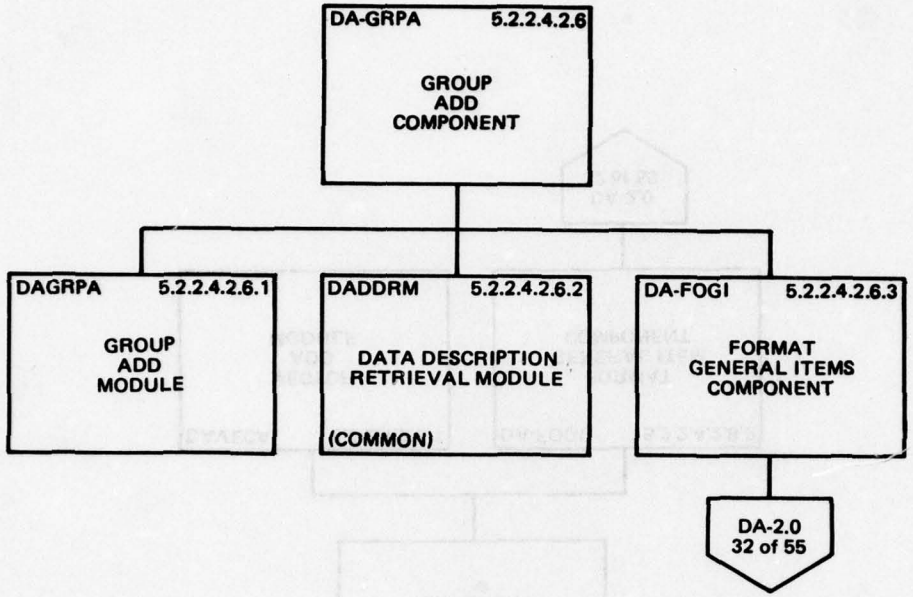


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (30 of 55)

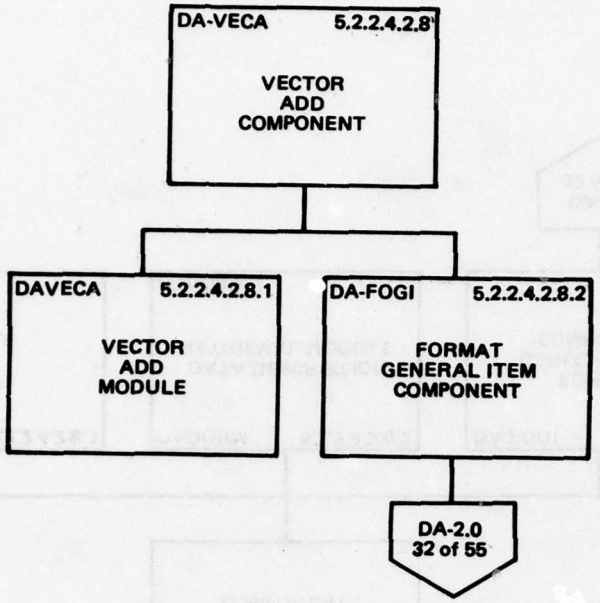


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (31 of 55)

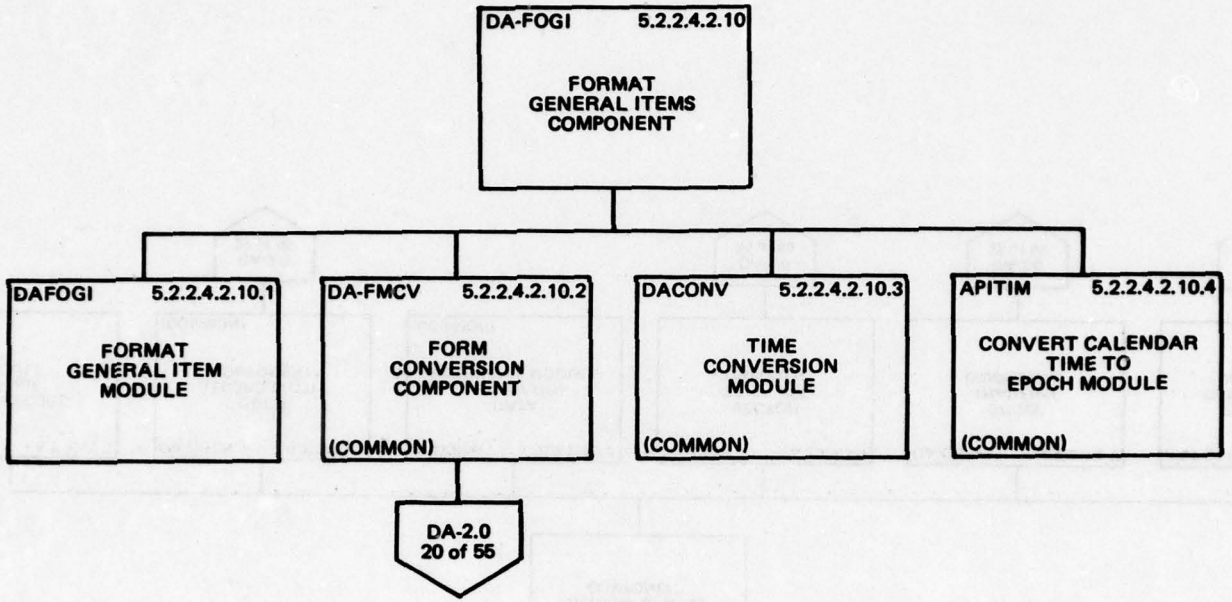


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (32 of 55)

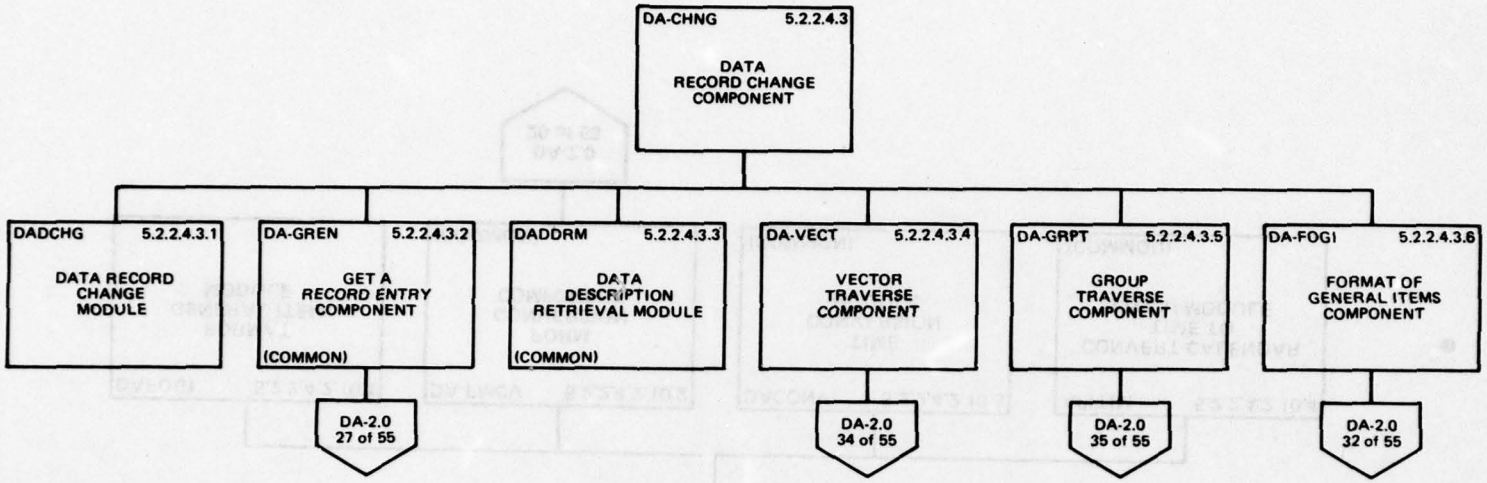


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (33 of 55)

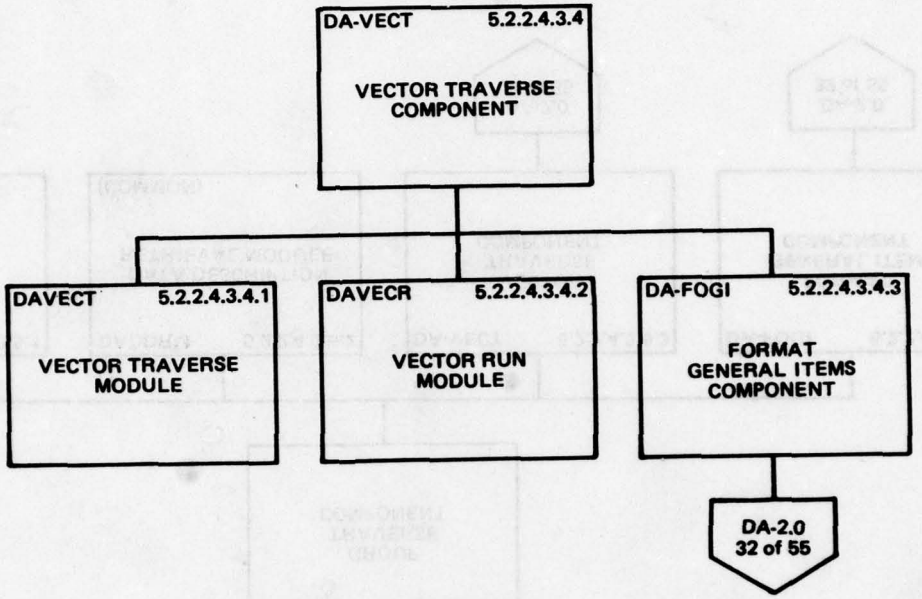


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (34 of 55)

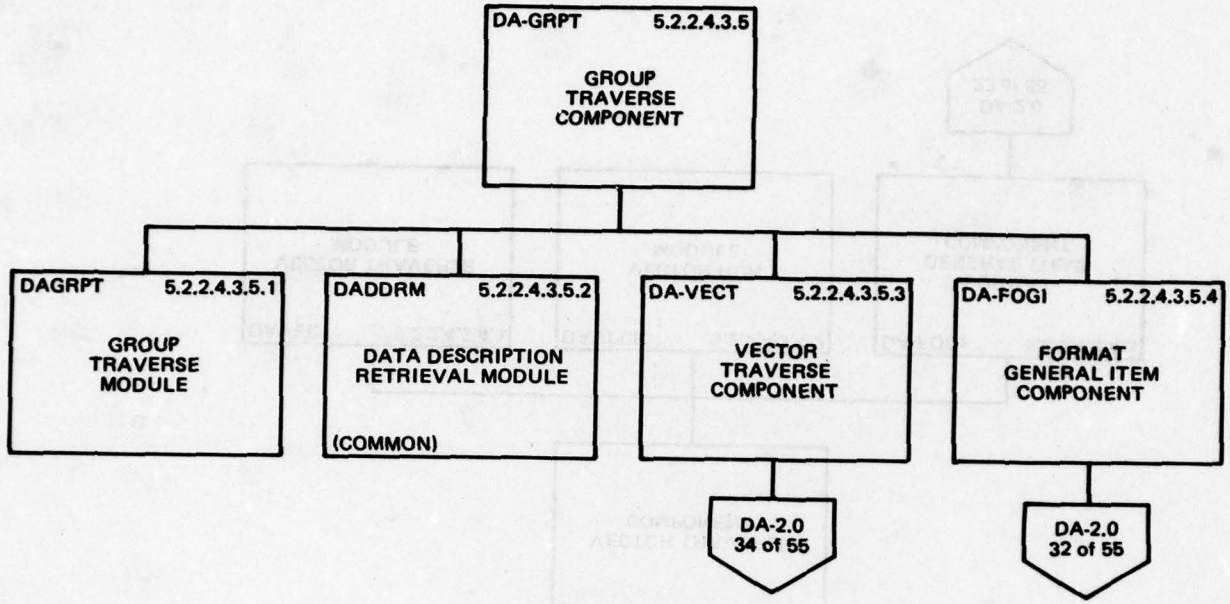


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (35 of 55)

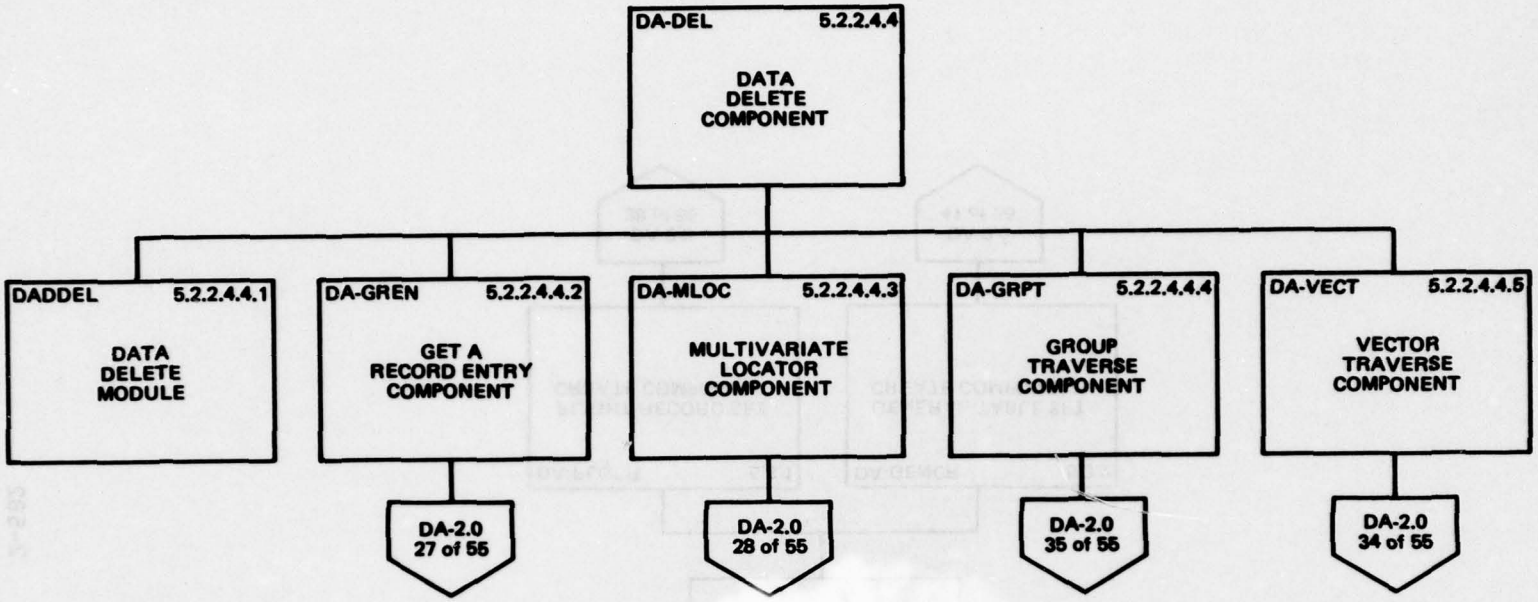


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (36 of 55)

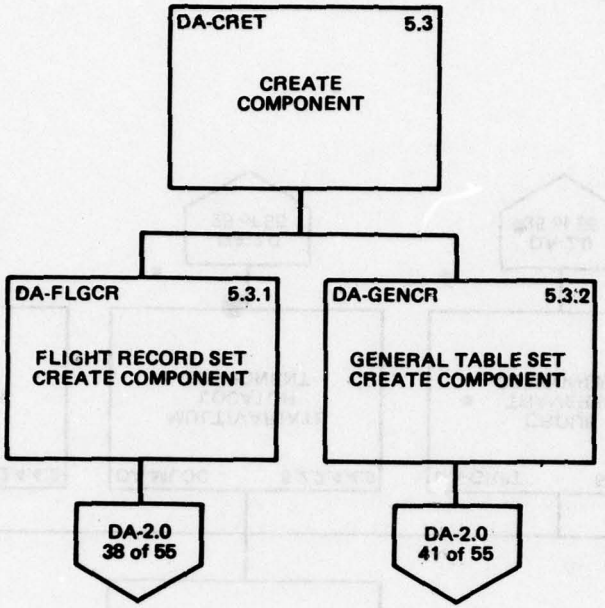


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (37 of 55)

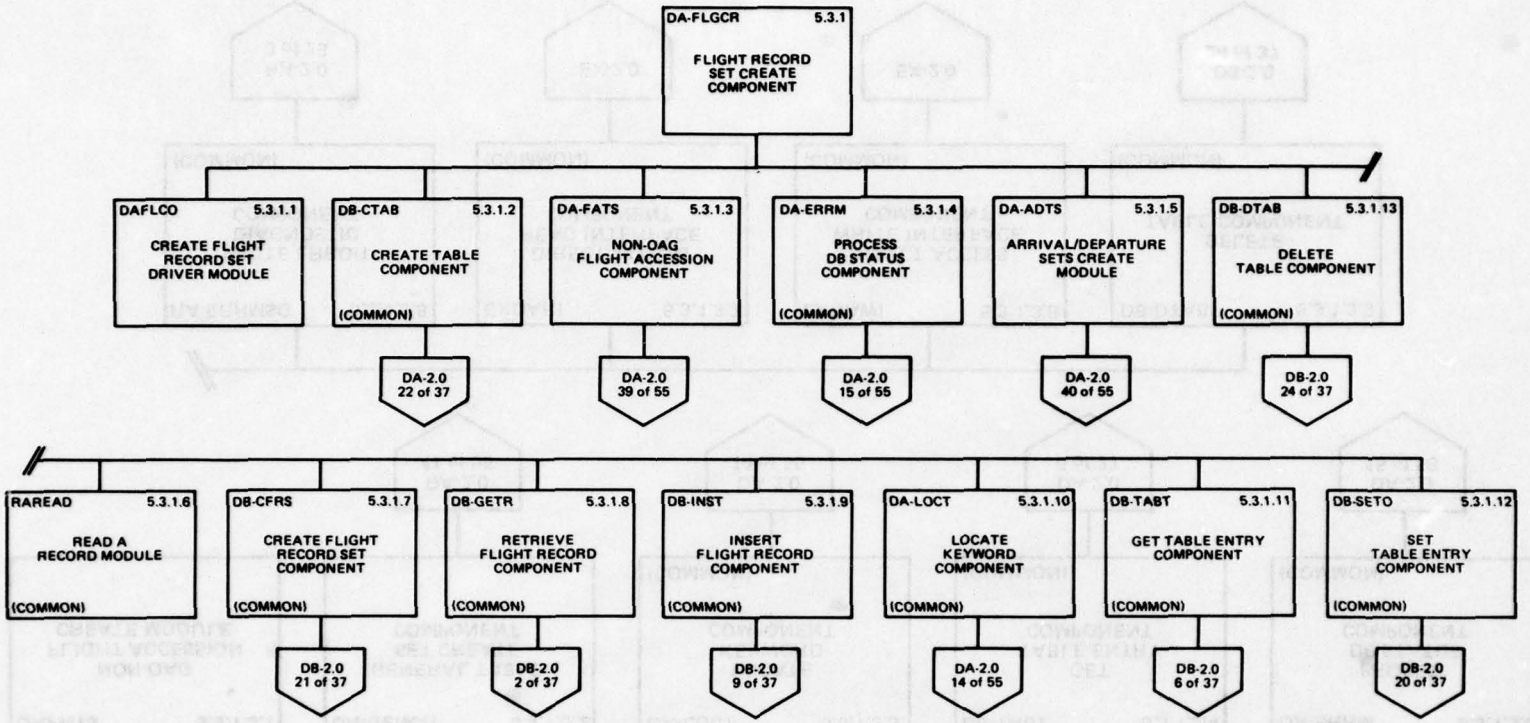


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (38 of 55)

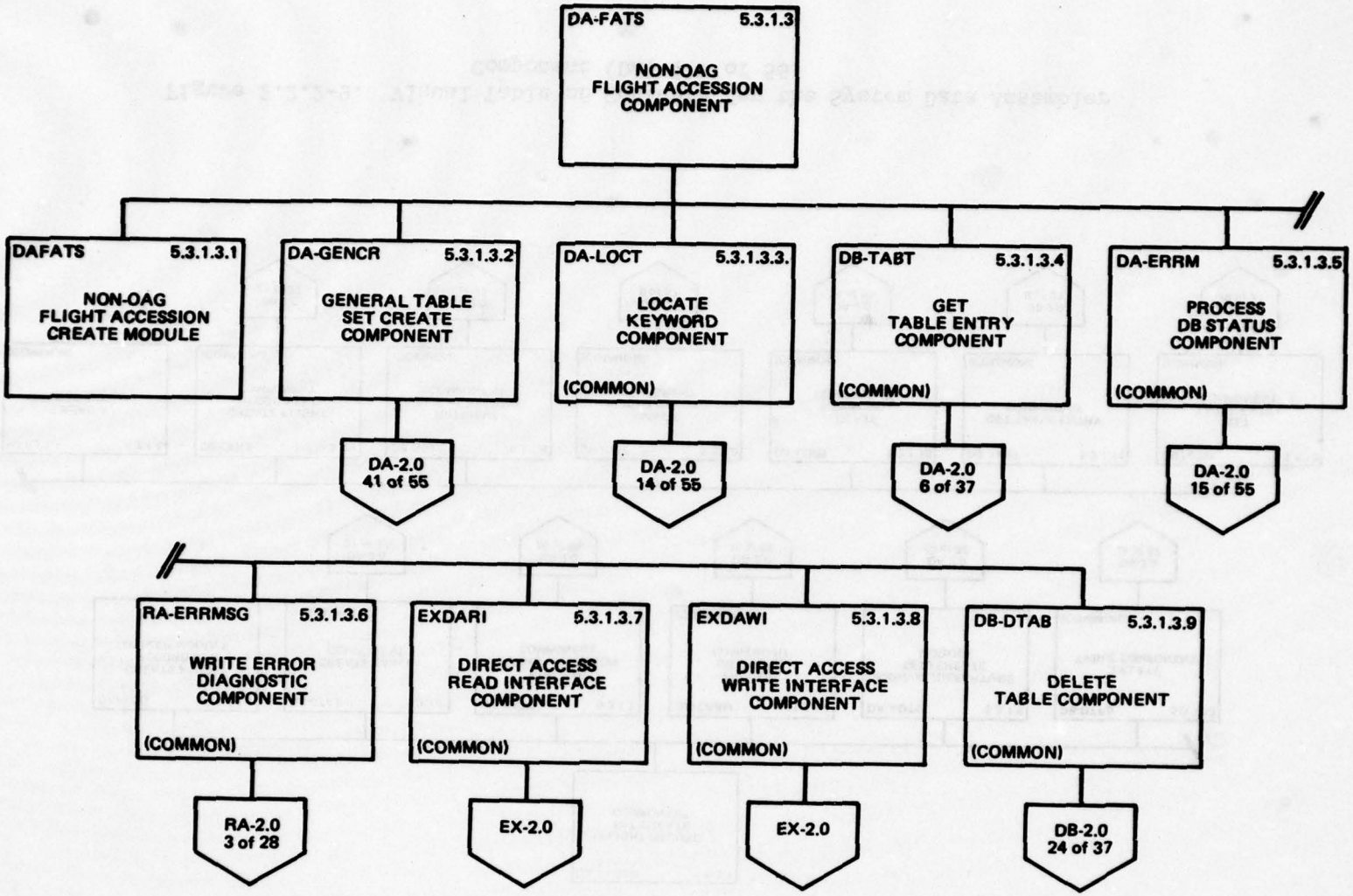


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (39 of 55)

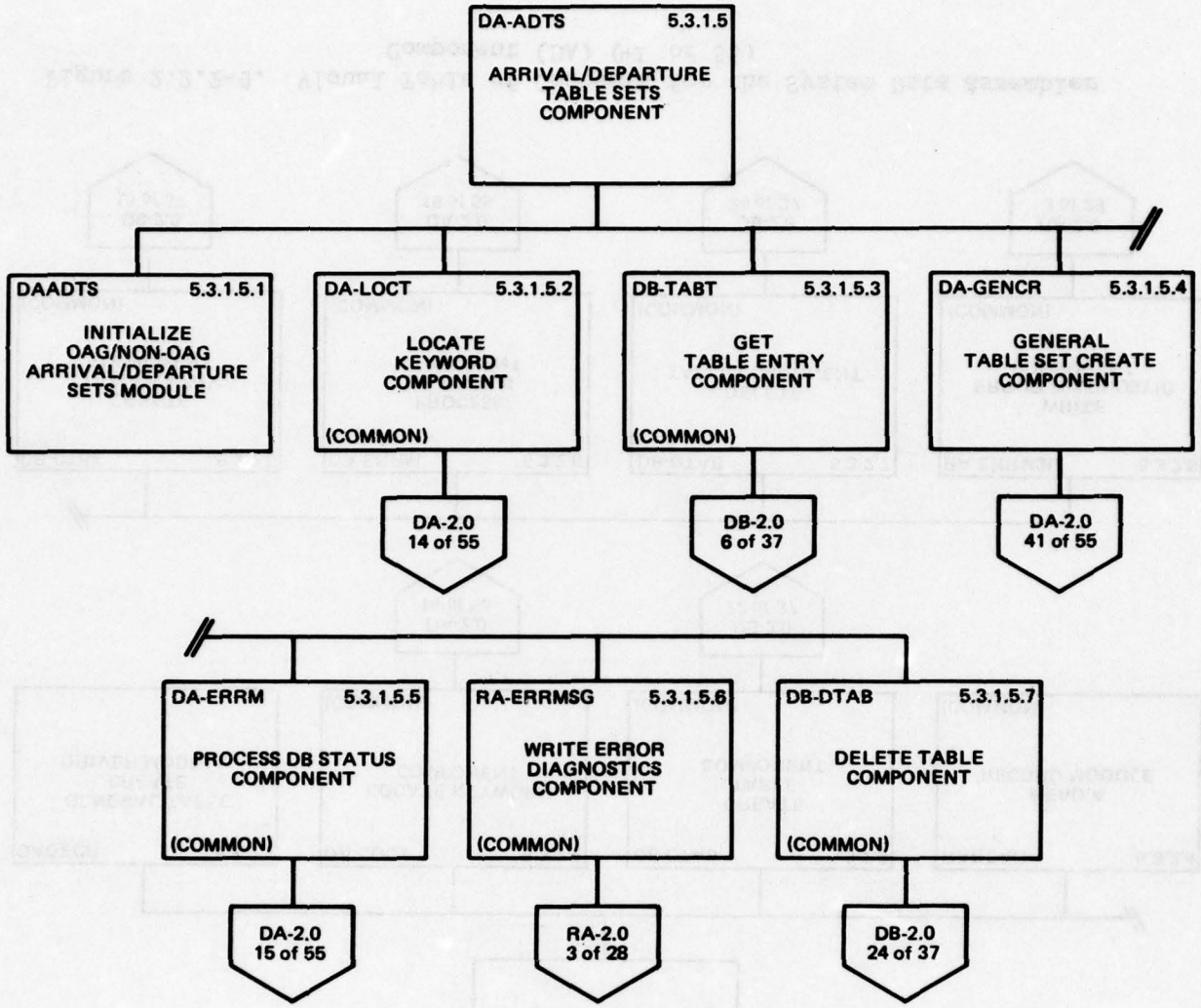


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (40 of 55)

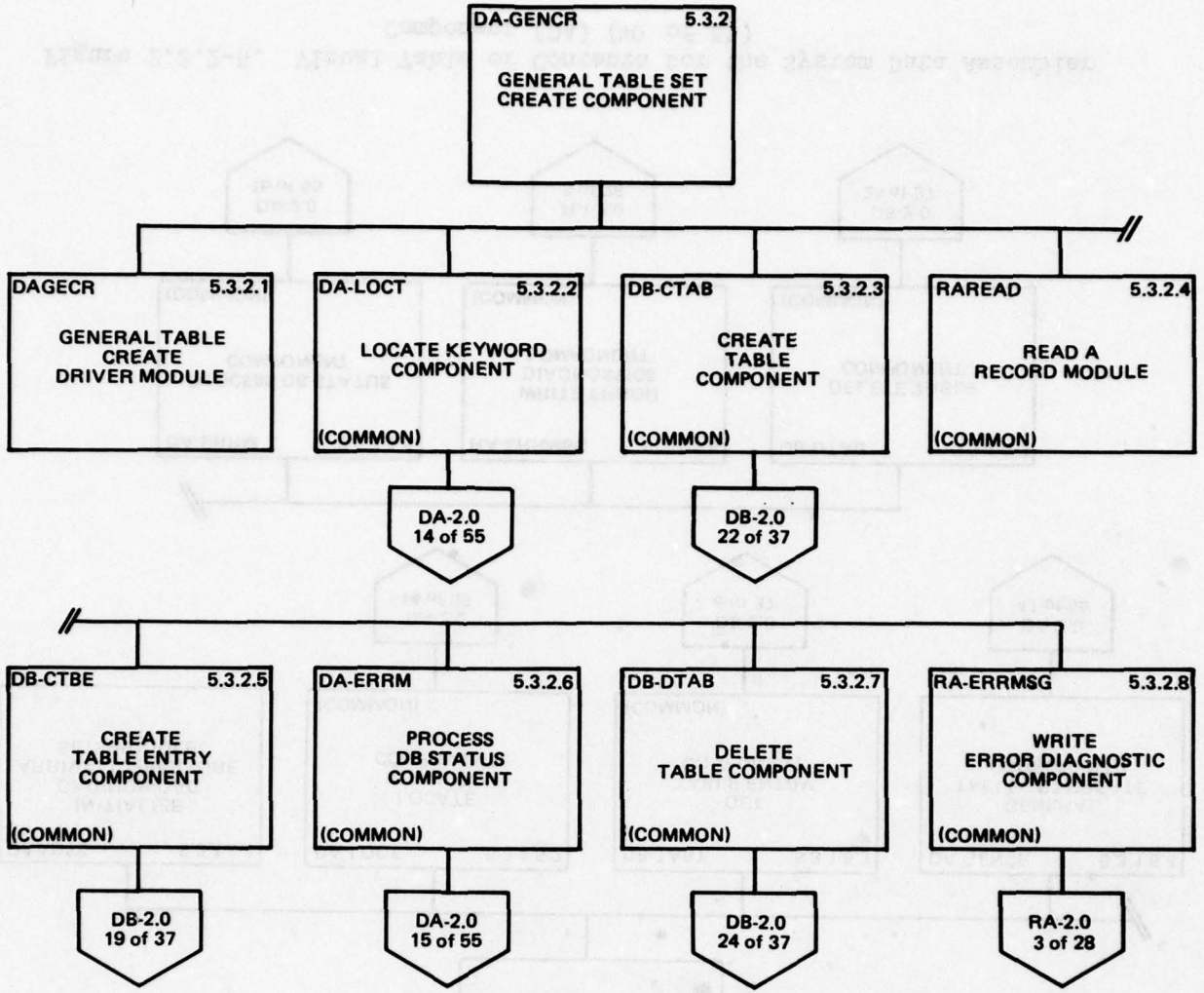


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (41 of 55)

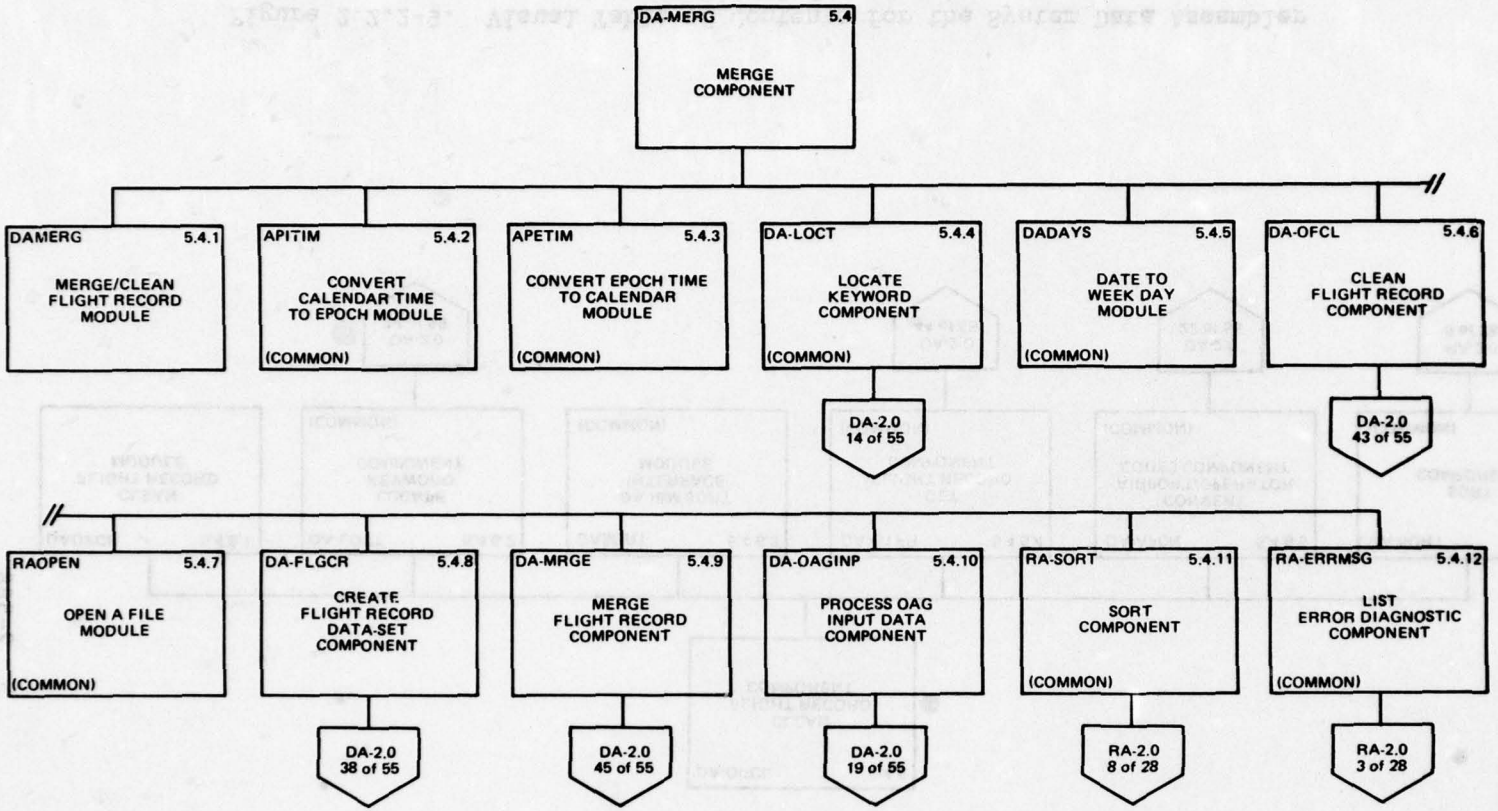


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (42 of 55)

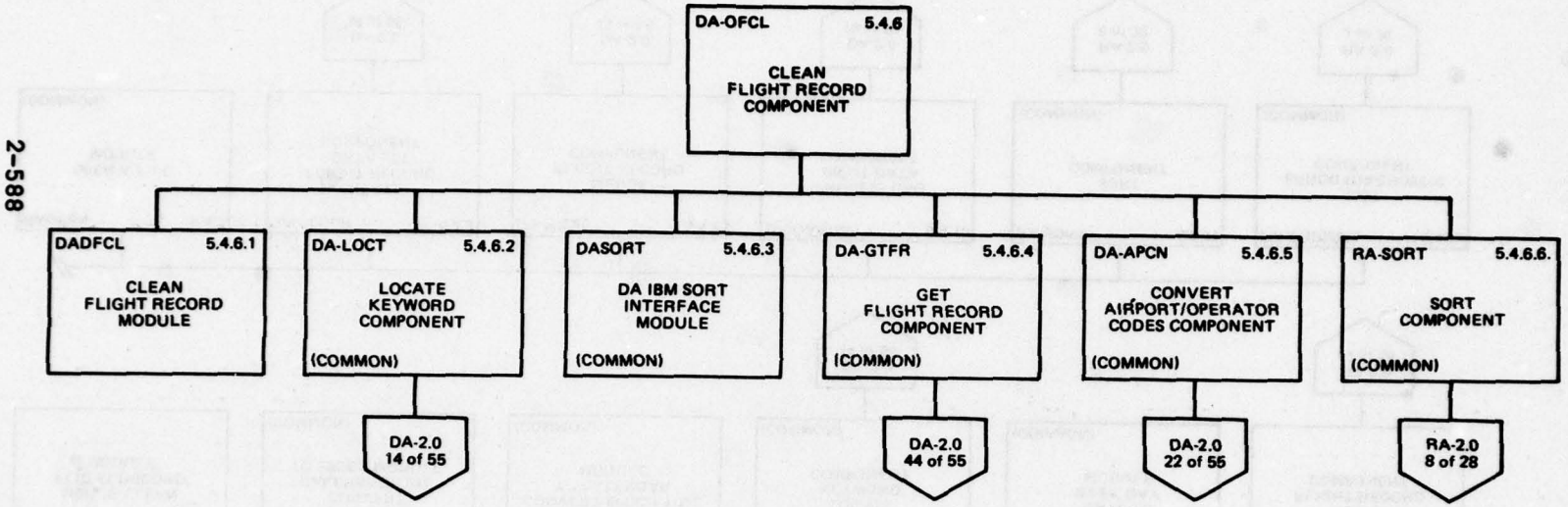


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (43 of 55)

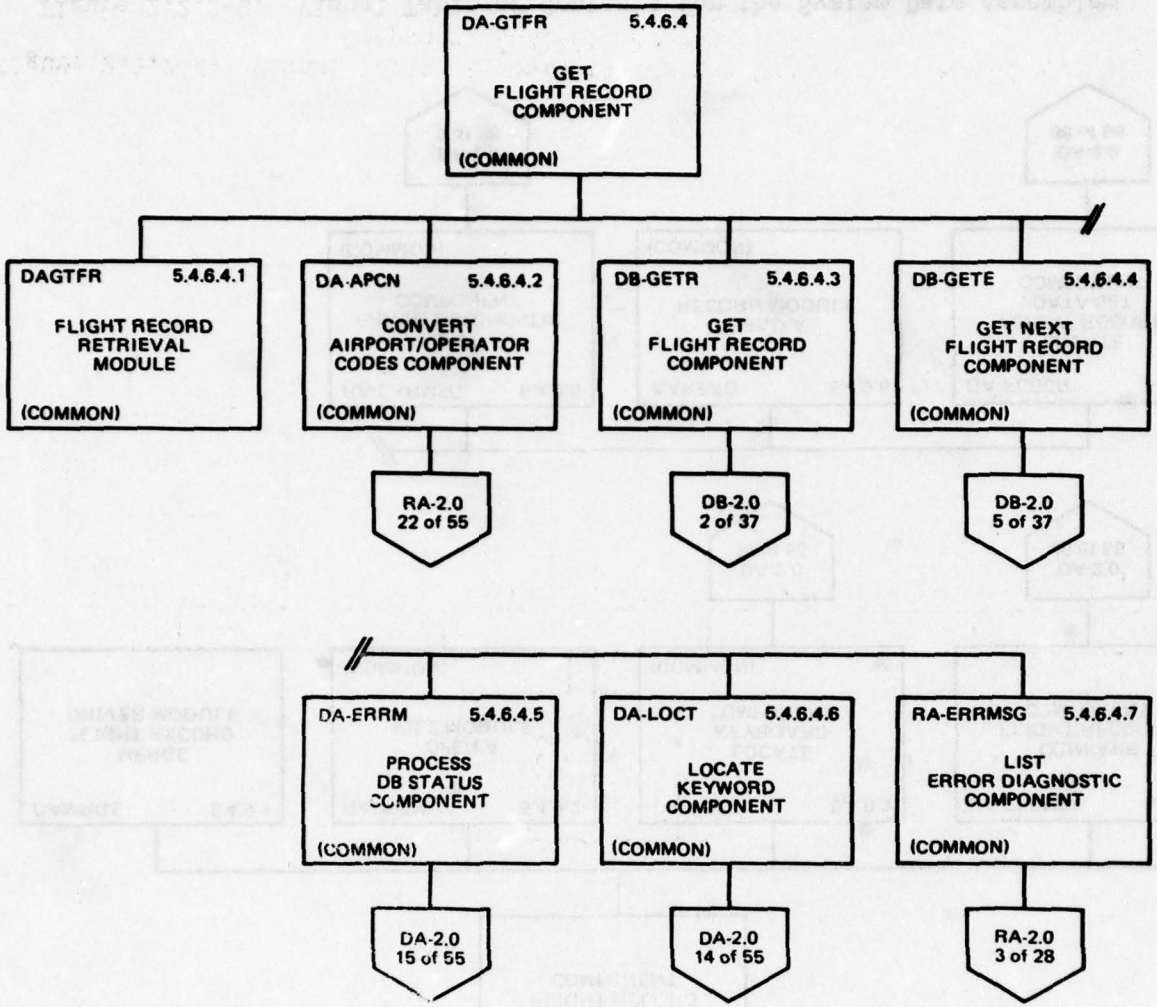


Figure 3.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (44 of 55)

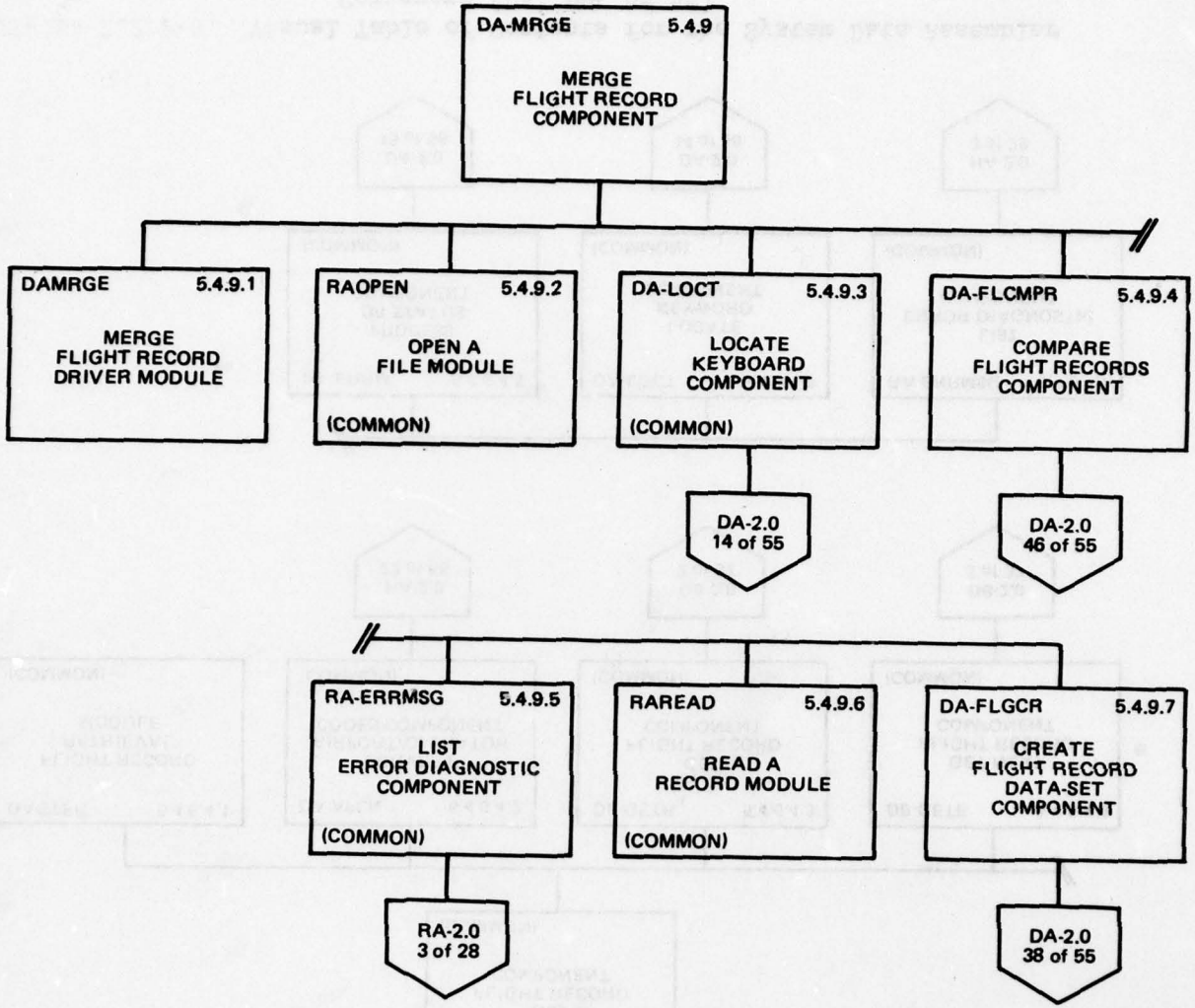


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (45 of 55)

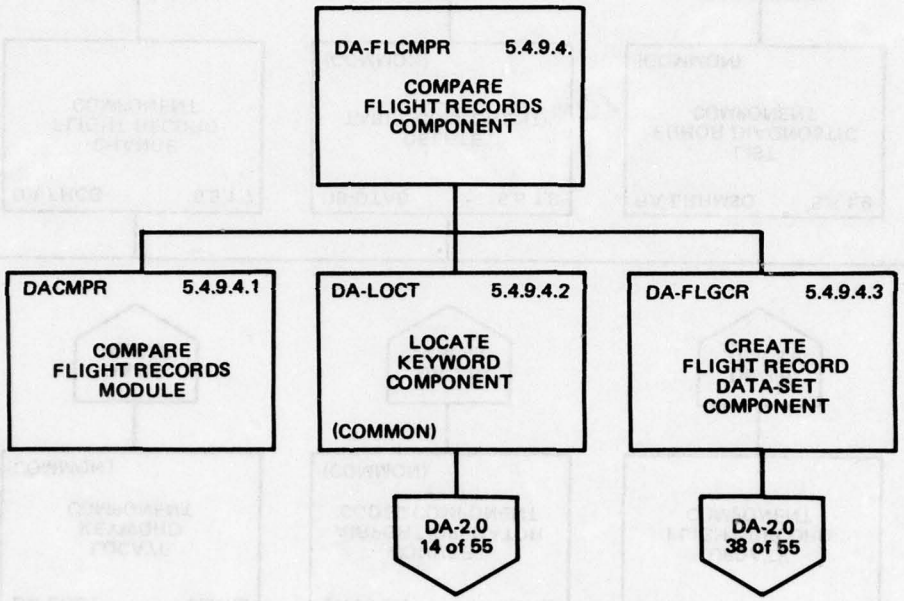


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (46 of 55)

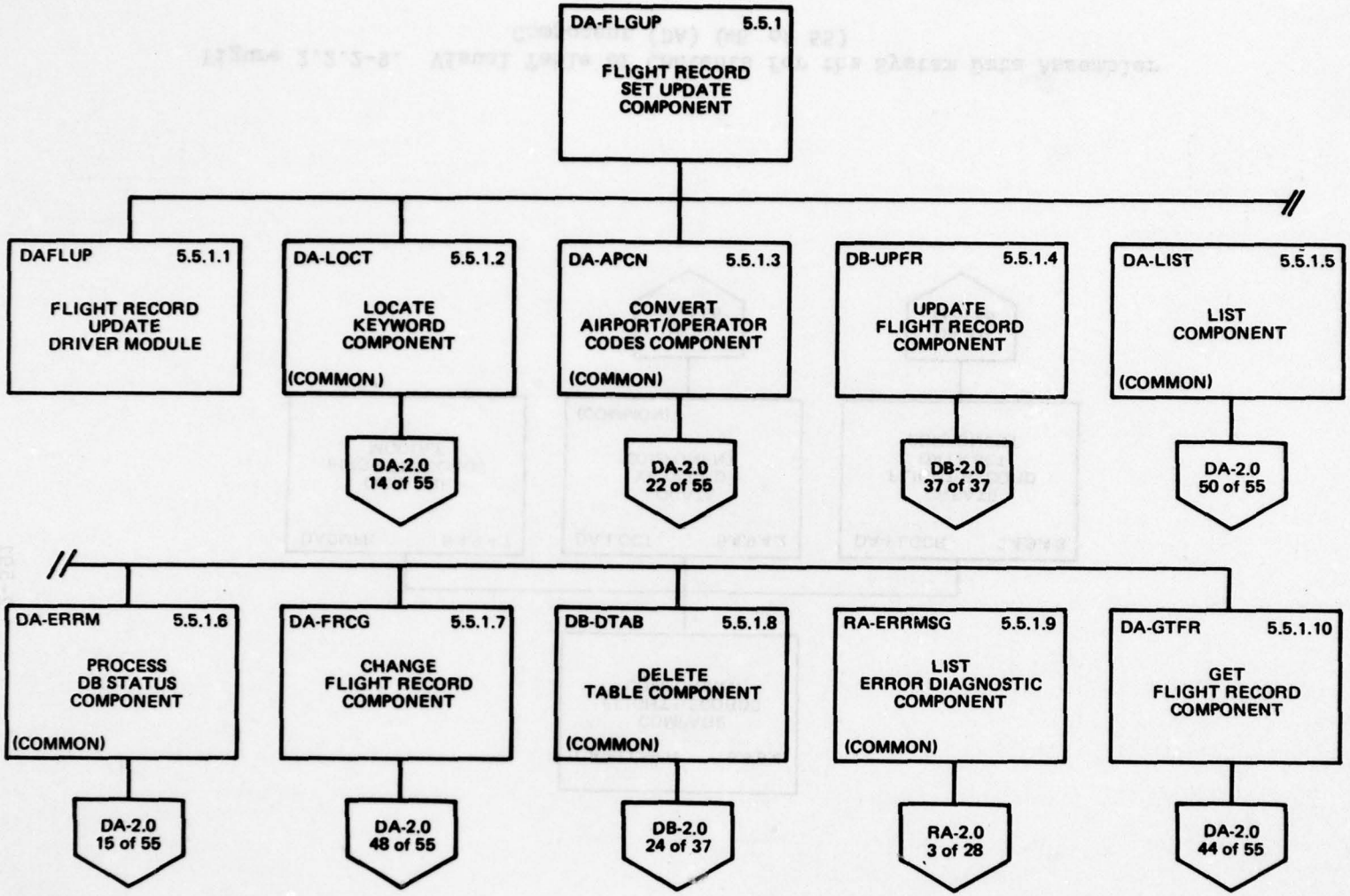


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (47 of 55)

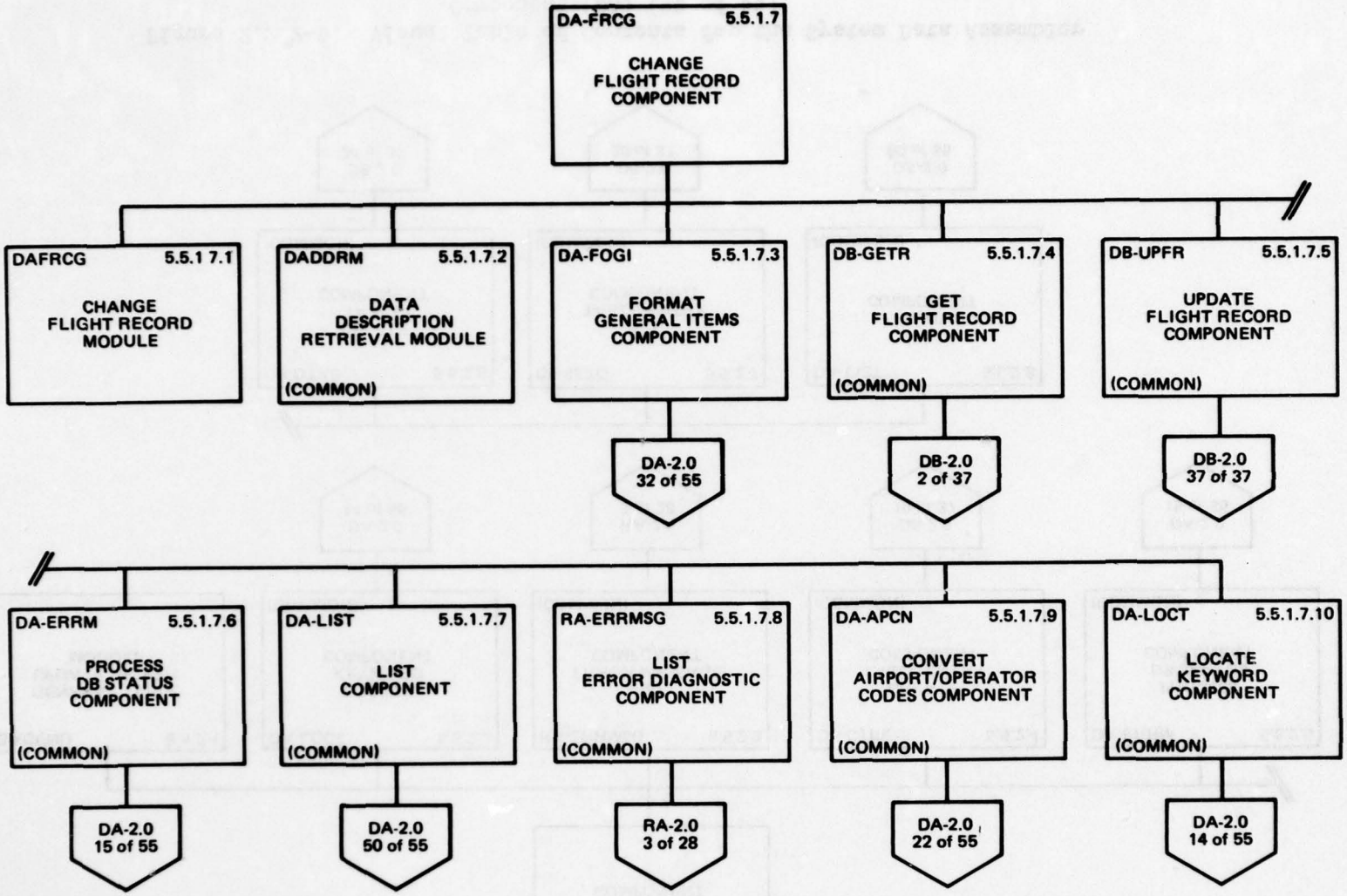


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (48 of 55)

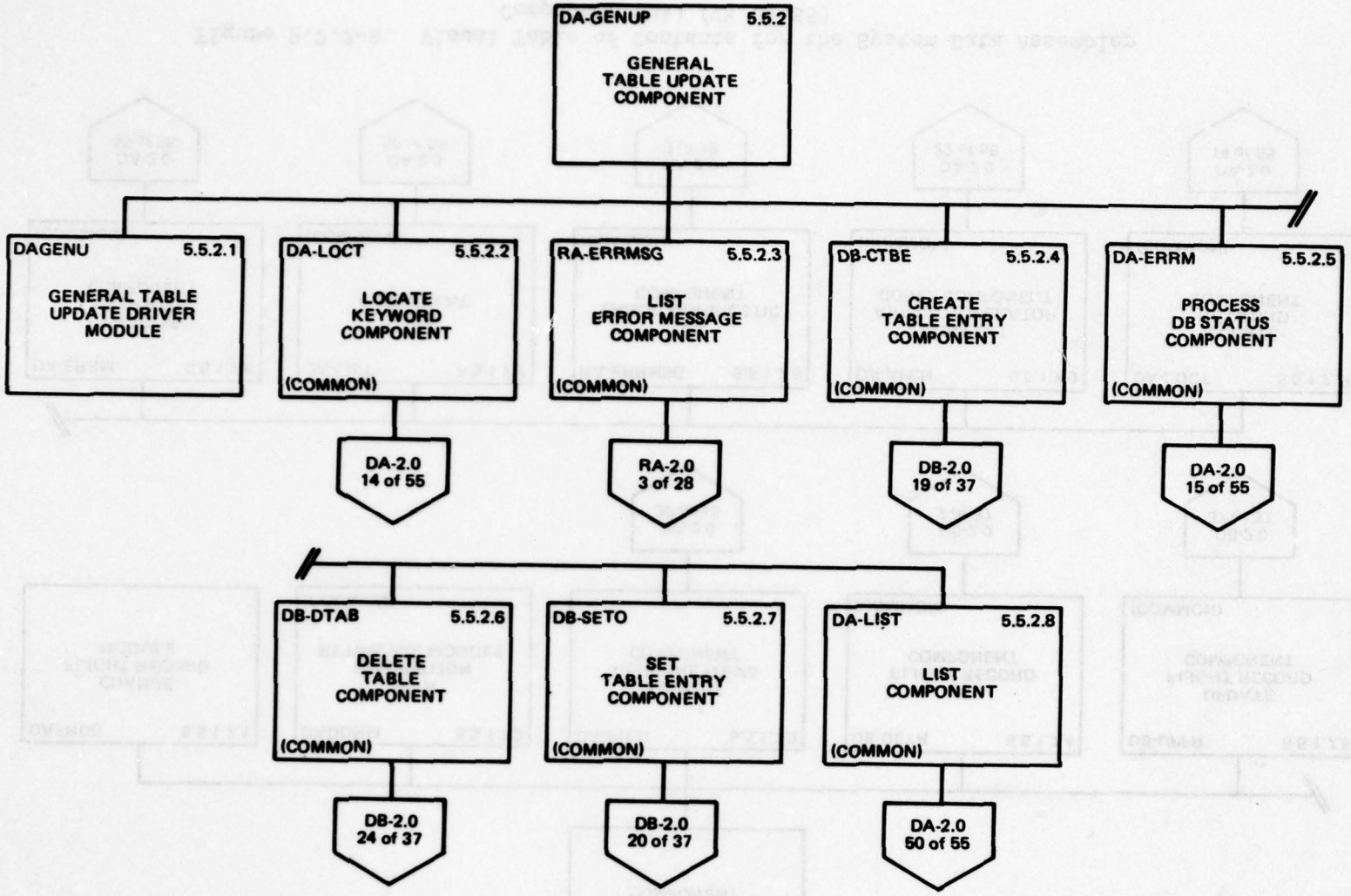


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (49 of 55)

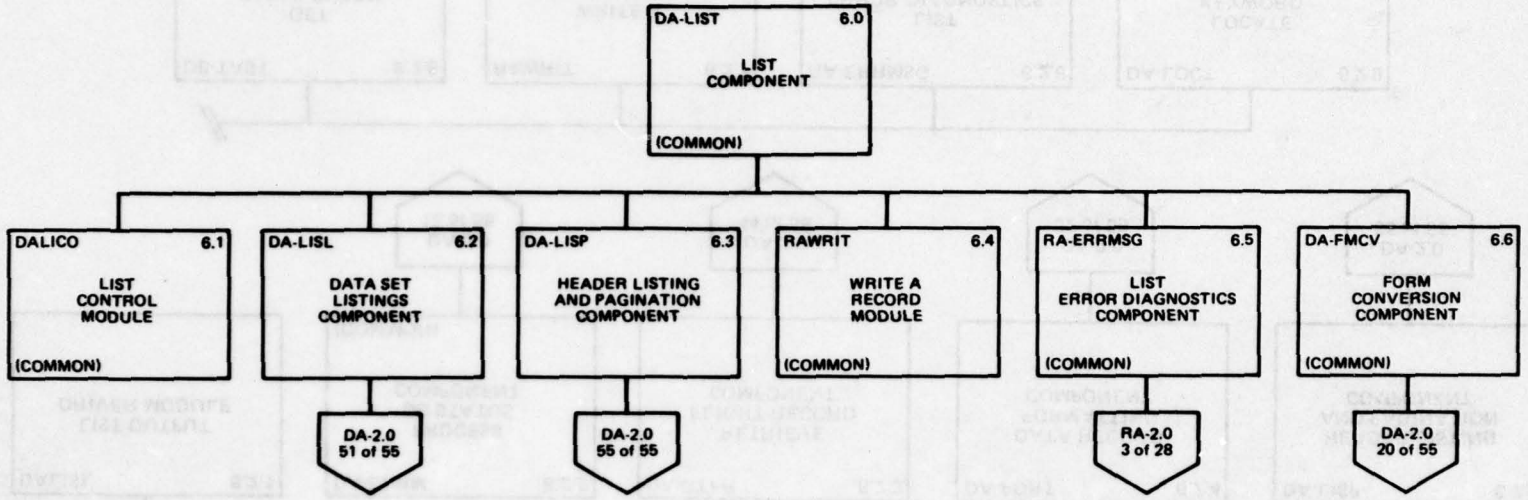


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (50 of 55)

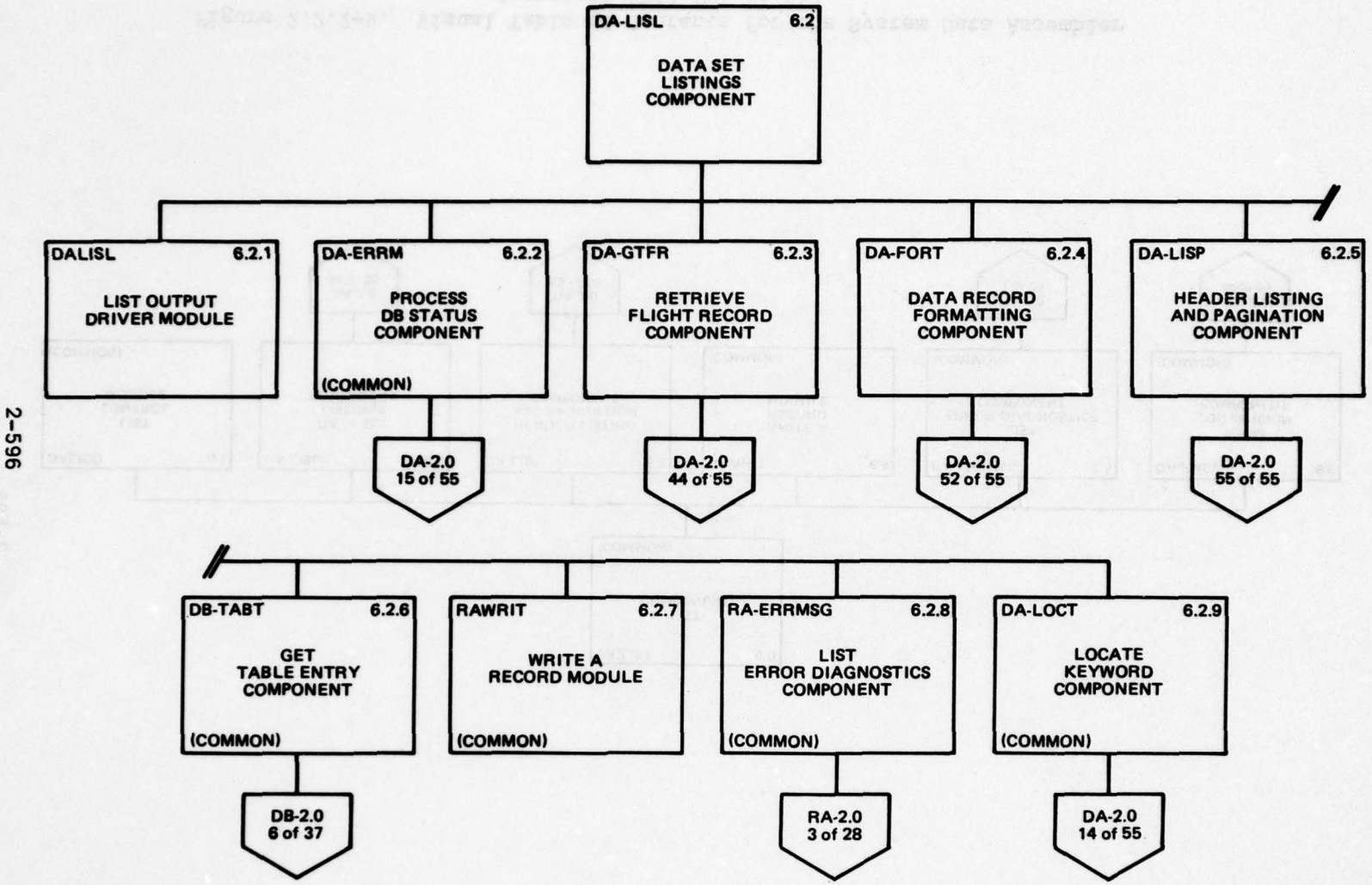


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (51 of 55)

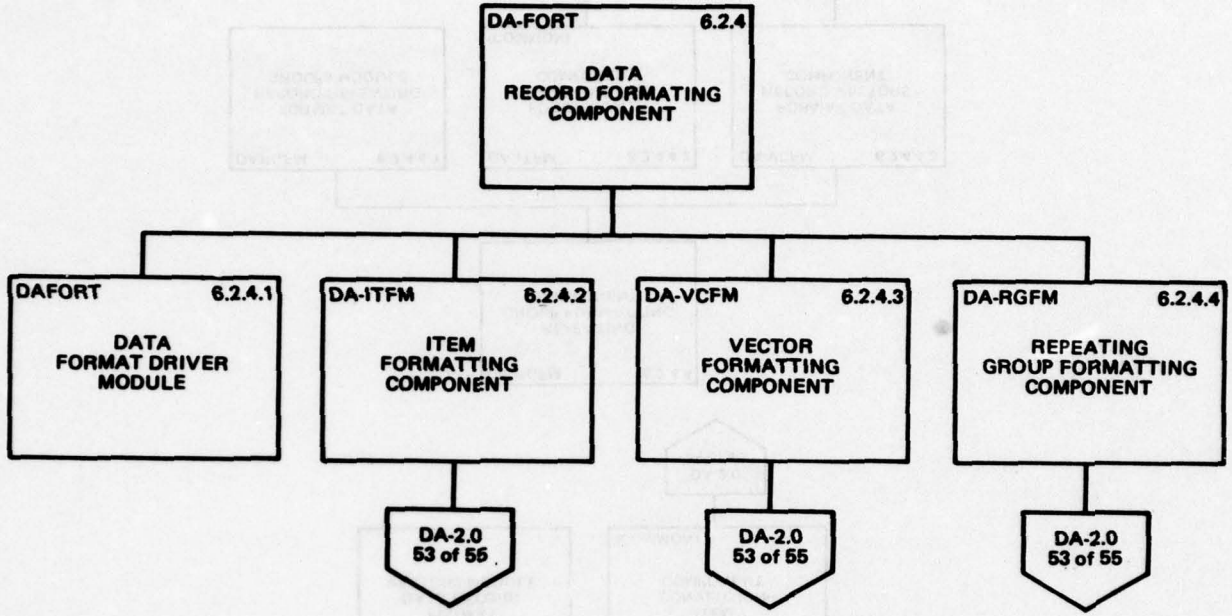


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (52 of 55)

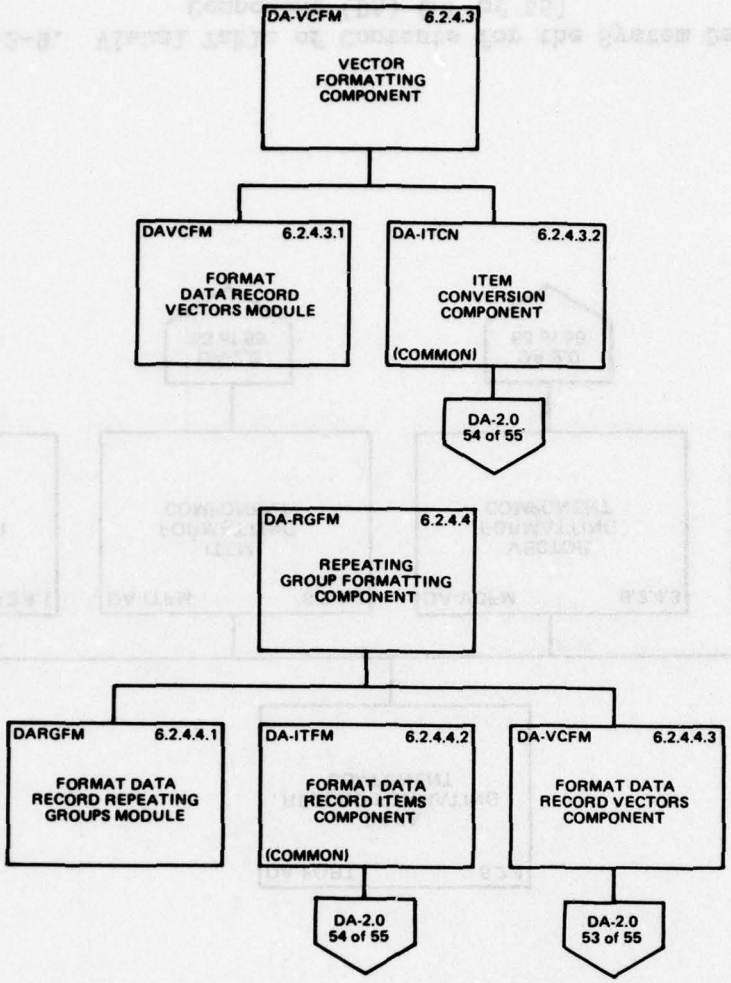


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (53 of 55)

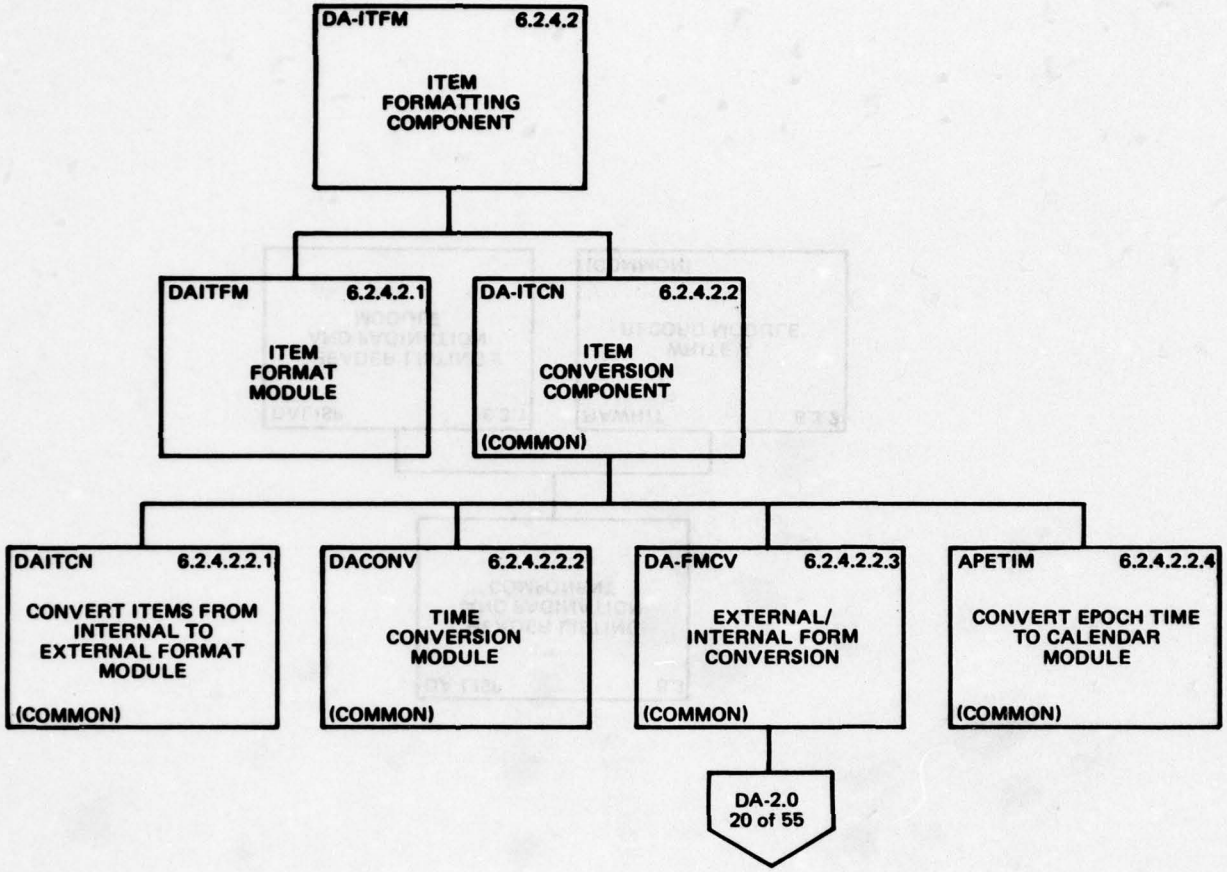


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (54 of 55)

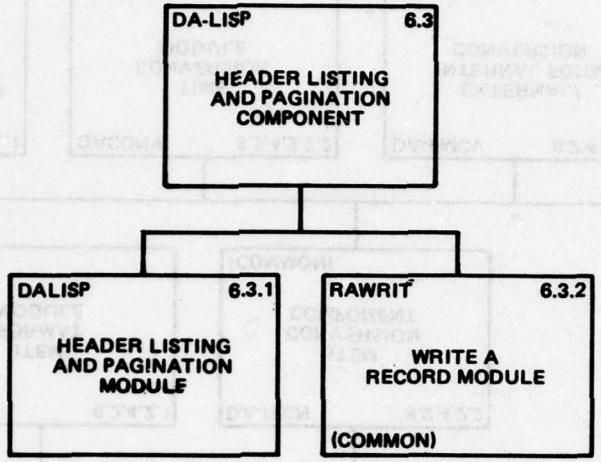


Figure 2.2.2-9. Visual Table of Contents for the System Data Assembler Component (DA) (55 of 55)

2.2.2.2.2.4 Description Section for the Visual Table of Contents for the System Data Assembler (DA) Component

2.0 The System Data Assembler (DA) Component is an offline program that provides the capability to create, update, and list the CFC Software System data base sets.

3.0 The Executive (DAEXEC) Module is the main program for the DA Component and controls processing of the DA-PRCN, DA-CRUP, and DA-LIST Components. It opens and closes all required files.

3.1 Incore File Address Interface (EXIFAI) Module returns address of the specified core resident CFC data base sets.

3.2 The Get Data-Base Work Area Address (DB-WAIM) Component returns address of the work area to be used by the Data Base Management (DB) Subsystem modules.

3.3 Open a File (RAOPEN) Module opens the user-specified SYSIN data set so that control cards can be subsequently read.

3.4 Close Data Base Sets (DA-CLOS) Component completes input/output processing for the specified data set.

3.4.1 Terminate Data Base Input/Output (DATERM) Module causes all open data base sets to be closed.

3.4.2 Get DCB Address (DAGDCB) Module locates and returns the address of a DCB in a linked list.

3.4.3 Close Data Set DCB (DACLOS) Module closes a DCB previously opened by DAOPN, delinks it from the DCB chain, and deallocates the core it occupied.

3.5 List Error Diagnostics (RA-ERRMSG) Component lists a specified error message associated with opening a specified data set or aborting the load module processing.

3.6 Shut a File (RASHUT) Module closes input control card, control card listing, input raw data listing, data base record listing, and DA error diagnostic message data sets.

4.0 The Process Control Cards (DA-PRCN) Component reads, scans, lists, and validates program control inputs.

4.1 The Process Control Cards (DAPRC0) Module controls processing of all modules in the DA-PRCN Component. It reads cards from SYSIN into the input control card buffer (H0), verifies the order of the control cards, and passes control to the subordinate modules to process each card.

4.2 Process General Control Cards Component (DA-GCCD) verifies information supplied on the general control card.

4.2.1 Process General Control Card Driver Module (DAGCCP) verifies keywords and keyword values on the general control card. It sets the mode of operation and the DDNAME of the existing data base into the COMPOOL from information on the card.

4.2.2 List Component (DA-LIST) is called to list the DA general control cards.

4.2.3 List Error Diagnostic Component (RA-ERRMSG) lists error messages associated with the general control card. This component is in the RA Component.

4.2.4 Scan A Record (RA-SCANER) Component scans general control card data-items. This module is in the RA Component.

4.2.5 Data Base Startup (DB-STUP) Component restores the CFC data base from the backup tape and loads core resident data sets.

4.3 Process Output List Specification Cards Component (DA-OLSC) verifies information supplied on the output list specification card and opens the specified files.

4.3.1 Process Output List Specification Card Driver Module (DAOLSP) validates the keywords on the output list specification card and opens the specified files for the control card listing, the data base listing, the raw data input card listing, and error message file.

4.3.2 List Component (DA-LIST) lists the output list specification card.

4.3.3 Open A File (RAOPEN) Module opens the user-specified data set.

4.3.4 List Error Diagnostic Component (RA-ERRMSG) lists error messages associated with the output list specification card.

4.3.5 Scan A Record Component (RA-SCANER) scans given output list specification card data-items. This module is in the RA Component.

4.4 Process Create Control Cards Component (DA-CRCN) verifies information supplied on a create data-set specification card and builds an entry in the interface control table for each card properly processed.

4.4.1 Process Create Control Card Module (DACRET) validates and translates the control information from the create data-set specification card into entries of the interface control data set.

4.4.2 Scan A Record Component (RA-SCANER) scans given create data-set specification card data-items.

4.4.3 Check Table Dependency Module (DADEPT) determines inter-data-set dependencies for a given data set ID in order to sequence the creation of data sets properly.

4.4.4 List Component (DA-LIST) lists the specified create data-set specification cards.

4.4.5 List Error Diagnostic Component (RA-ERRMSG) lists error messages associated with the create data-set specification card.

4.5 Process List Control Card Component (DA-LCNT) verifies the information supplied on a list data-set specification card and builds an entry in the interface control table set for each card properly processed.

4.5.1 List Data-Sets Driver Module (DALCNT) controls the execution of other modules/components in this component, verifies the keywords and keyword values on the card and builds an entry in the interface control table set and the input data record description set.

4.5.2 List Component (DA-LIST) lists the specified list data-set specification cards.

4.5.3 Scan A Record Component (RA-SCANER) scans the list data-set specification card for each data-item.

4.5.4 List Error Diagnostic Component (RA-ERRMSG) lists error messages associated with the list data-set specification cards.

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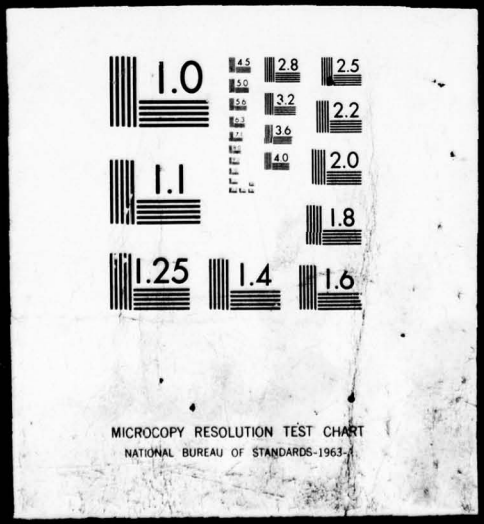
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4.6 Process Update/Merge Control Card Component (DA-ULMN) verifies information supplied on an update or merge data-set specification card and builds an entry in the interface control table for each card properly processed.

4.6.1 Process Update and Merge Control Cards (DAUPLM) Driver Module controls the execution of other modules/components. This module verifies keywords and keyword values on the update and merge data-set specification cards and builds an entry in the interface control table set for each card correctly processed.

4.6.2 Scan A Keyword/Equals/Value/Semicolon Sequence (DA-SCAN) Component scans the data-set specification card for each sequence.

4.6.2.1 Scan A Keyword/Equals/Value/Semicolon Sequence (DASCAN) Driver Module, by controlling the execution of other modules/components in this component, extracts one sequence and performs basic validation on it.

4.6.2.2 Scan A Record (RA-SCANER) Component parses the data-set specification card and returns each separate field to the called module.

4.6.2.3 List (DA-LIST) Component lists the data-set specification card.

4.6.2.4 List Error Diagnostics (RA-ERRMSG) Component lists error messages associated with the data-set specification card.

4.6.3 List Component (DA-LIST) lists the update or the merge specification card.

4.6.4 List Error Diagnostic Component (RA-ERRMSG) lists error messages associated with the update or the merge specification card.

4.6.5 List Data-Sets Affected Component (DA-MSEL) validates a user-specified data set as updatable or not, and if necessary, generates warning messages to the user if the data set being updated may cause other data sets to require updating.

4.6.5.1 List Data-Sets Affected Driver Module (DAMSEL) controls the execution of other modules/components in this component.

4.6.5.2 List Component (DA-LIST) lists the update specification card.

4.6.5.3 List Error Diagnostic Component (RA-ERRMSG) lists an error message if other data sets should be updated.

4.7 Scan A Record Component (RA-SCANER) scans the DA control card for each data-item.

4.8 List Component (DA-LIST) lists the DA control cards.

4.9 List Error Diagnostic Component (RA-ERRMSG) lists error messages associated with the general control card.

4.10 Read a Record Module (RAREAD) reads a record from the input control card data set.

5.0 Create/Update Component (DA-CRUP) opens and closes input raw data files; reads, scans, lists, validates, and formats input raw data records into the data base record format. It either creates new data base sets, updates existing data base sets, or merges the input OAG flight records with the existing OAG Flight Record Set.

5.1 Control Component (DA-CNTR) controls processing of all modules contained in the DA-CRUP Component.

5.1.1 Create/Update Driver Module (DACUDR) controls processing of all control modules related to create, update, and merge operations for a specified CFC data set. It opens and closes specified input raw data sets.

5.1.2 Airport/Center Table Component (DA-APTS) controls the creation and updating of the Airport and Center Table Sets.

5.1.2.1 Airport Table Driver Module (DAAPTS) controls the execution of other modules/components in this component. It creates the Airport Table sets and updates either the Airport or the Center Table sets.

5.1.2.2 Create Center Table Component (DA-CENT) controls the creation of the Center Table set.

5.1.2.2.1 Create Center Table Driver Module (DACENT) controls the execution of other modules/components in this component. It creates the Center Table set from the Airport Table set.

5.1.2.2.2 Open A File Module (RAOPEN) opens the specified sort input or output data sets.

5.1.2.2.3 Get Table Entry Component (DB-TABT) retrieves the specified Airport Table Set data record.

5.1.2.2.4 Write A Record Module (RAWRIT) outputs the specified data record on the specified sort input data set.

5.1.2.2.5 Shut A Data Set Module (RASHUT) shuts specified sort input or output data sets

5.1.2.2.6 Data-Set Item Location Component (DA-LOCT) determines the location and description of the specified data item in a data record for the specified data set.

5.1.2.2.7 Sort Component (RA-SORT) interfaces with the IBM Sort Module to sort data records in a specified order.

5.1.2.2.8 Read A Record Module (RAREAD) reads a record from the sorted data set.

5.1.2.2.9 General Table Set Create Component (DA-GENCR) create the Center Table set in the new data base.

5.1.2.2.10 Process DB Status Component (DA-ERRM) generates error diagnostic messages if data base retrieval errors are encountered.

5.1.2.2.11 List Error Message Component (RA-ERRMSG) lists error conditions encountered during data-set create processing.

5.1.2.2.12 Set Table Entry Component (DB-SETO) updates the Parameter Table set with the actual number of centers.

5.1.2.3 Data-Set Item Location (DA-LOCT) Component determines the location and description of the specified data item in a data record for the specified data set.

5.1.2.3.1 Locate Keyword Module (DALOCT) determines the location and description of the specified data item in a data record for the specified data set.

5.1.2.3.2 List Error Diagnostic Component (RA-ERRMSG) lists an error message if the Keyword cannot be found.

5.1.2.4 The Process General Table (DA-GINP) Component reads, scans, validates, converts, and formats the raw input data records for the Airport Table Set.

5.1.2.5 Open A File (RAOPEN) Module opens the specified sorted data set.

5.1.2.6 Read A Record (RAREAD) Module reads a sorted data record.

5.1.2.7 The General Table Set Create (DA-GENCR) Component creates a new Airport Table set in the data base.

5.1.2.8 List Error Message Component (RA-ERRMSG) lists error conditions encountered during Airport or Center Table sets updating or creation.

5.1.2.9 Set Table Entry Component (DB-SET0) updates the Parameter data set with the actual number of pacing airports.

5.1.2.10 General Table Update Component (DA-GENUP) updates either the Airport or the Center Table set's data records in the data base.

5.1.2.11 Process DB Status Component (DB-ERRM) generates error diagnostic messages if data base errors are encountered.

5.1.2.12 Shut A File Module (RASHUT) shuts a specified sort output data set.

5.1.2.13 Delete Table Entry Component (DB-DTAB) deletes entry of the specified CFC data base set from the Table Mapping Table Set.

5.1.3 Process DB Status Component (DA-ERRM) generates error diagnostic messages if data base retrieval errors are encountered.

5.1.3.1 Process DB Status Module (DAERRM) detects the presence of a DB status error and prints appropriate error message.

5.1.3.2 List Error Diagnostic Component (RA-ERRMSG) lists the error condition found during data base access.

5.1.4 Flight Record Related Data Set Control (DA-FLRS) Component controls processing of all modules related to creating, merging, or updating OAG or non-OAG flight record data sets.

5.1.4.1 Flight Record Driver Module (DAFLRS) controls execution of other modules/components in this component. It opens and closes the OAG Header data set and reads the Aircraft Class Table and Operational Category Table Sets in to core.

5.1.4.2 Process DB Status (DA-ERRM) Component generates error diagnostic messages if data base retrieval errors are encountered.

5.1.4.3 Create Flight Record Set (DA-FLGCR) Component creates the OAG or non-OAG Flight Record Sets in the new data base.

5.1.4.4 Update Flight Record Set (DA-FLGUP) Component adds, changes, or deletes data records from the OAG or non-OAG Flight Record Sets.

5.1.4.5 Process General Table Data (DA-GINP) Component parses and formats input flight record data for update.

5.1.4.6 Locate Keyword Component (DA-LOCT) determines the location and description of the specified data item in a data record for the specified data set.

5.1.4.7 Merge Component (DA-MERG) either merges new OAG tape data records with the existing OAG flight record set or cleans the OAG or non-OAG flight record sets.

5.1.4.8 Process OAG Input Data Component (DA-OAGINP) validates the OAG tape data records and formats them into OAG flight record set image.

5.1.4.9 Get Table Entry Component (DB-TABT) retrieves specified data records from the specified data base set.

5.1.4.10 List Error Diagnostics Component (RA-ERRMSG) lists error conditions encountered during data set creation, updating, or merge operation.

5.1.4.11 Open A File (DAOPN) Module opens the specified data set.

5.1.4.12 Read A Record (DARED) Module reads the specified data record from the specified data set.

5.1.4.13 Close Data Set DCB Module (DACLOS) closes a DCB previously opened by DAOPN, delinks it from the DCB chain, and deallocates the core it occupied.

5.1.4.14 List Component (DA-LIST) lists formatted data base records.

5.1.5 Open A Data Set Module (DAOPN) opens the input OAG tape data set for input (read) activity using the OS/9020 OPEN supervisor instruction.

5.1.6 Other Table Control Component (DA-OTCS) controls processing of all modules related to creating or updating the following data base sets: ZOTS(ZO), NGTS(NJ), UGTS(UJ), NCTS(NY), UCTS(UY), ODTS(OD), OFTS(OX),CONT(CO), AOTS(AO), NOTS(NO), FXTS(AV), AFTS(AF), PATS(PT), ATTS(PY), ACTS(PK), OCTS(OK), TEMS(MM), ATCS(PW), AOCS(VW), OHOT(HS), NHOT(HK).

5.1.6.1 Other Tables Control Module (DAOTCS) controls execution of other modules/components in this component.

5.1.6.2 The Process General Table data (DA-GINP) Component reads, scans, validates, converts, and formats the raw input data records into specified data set record format.

5.1.6.3 General Table Create Component (DA-GENCR) initializes the TZ data-set and creates specified data sets.

5.1.6.4 Create AF or PK Data Sets Component (DA-FXTS) controls processing of all modules and components for creating the following data base sets: Airport Fix Table Set (AF) and Aircraft Class Table Set (PK).

5.1.6.4.1 Create AF or PK Data Sets (DAFXTS) Module controls processing of all modules for creating the following data base sets: Airport Fix Table Set (AF) and Aircraft Class Table Set (PK). It creates either AF or PK data sets from Arrival Fix Table Set (AV) or Aircraft Type Table Set (PY), respectively.

5.1.6.4.2 Open A File Module (RAOPEN) opens the sort input data set.

5.1.6.4.3 Read A Record Module (RAREAD) reads sorted data records into specified data buffer set.

5.1.6.4.4 Data Set Item Location (DA-LOCT) Component determines the location and description of the specified data item in a data record for the specified AV, AF, PY, or PK data sets.

5.1.6.4.5 Sort (RA-SORT) Component interfaces with the IBM SORT Module to sort data records in specified order.

5.1.6.4.6 List Error Diagnostics Component (RA-ERRMSG) lists diagnostic messages encountered during AF or PK data set creation processing.

5.1.6.4.7 General Table Create Component (DA-GENCR) creates specified AF or PK data sets.

5.1.6.4.8 Shut A File Module (RASHUT) closes specified sort out data sets.

5.1.6.5 The General Table Update Component (DA-GENUP) updates specified general table sets in the data base.

5.1.6.6 Data Set Item Locate Component (DA-LOCT) determines the location of and description of the specified data item in a data record for the specified table set.

5.1.6.7 Open A File Module (RAOPEN) opens the specified sorted data set.

5.1.6.8 Shut A File Module (RASHUT) closes the specified sorted data set.

5.1.6.9 Delete Table Entry Component (DB-DTAB) deletes the specified data set from the Table Mapping Table Set.

5.1.7 Get Table Entry Component (DB-TABT) retrieves a Parameter Table Set (PT) data record entry.

5.1.8 List Error Diagnostics Component (RA-ERRMSG) lists a specified error message associated with opening an input raw data set, or specified data set creation or update processing.

5.1.9 Open A File Module (RAOPEN) opens the input raw data set.

5.1.10 Shut A File Module (RASHUT) closes the input raw data set.

5.1.11 Close Data Set DCB Module (DACLOS) closes a DCB of the OAG tape data set previously opened by DAOPN, delinks it from the DCB chain, and deallocates the core it occupied.

5.2 The Process Input Component (DA-INP) reads, lists, scans, validates, converts, and formats the raw input data records.

5.2.1 Process OAG Input Data Component (DA-OAGINP) reads, lists, validates, converts, and formats the input OAG tape flight records into the OAG Flight Record Set data record format.

5.2.1.1 OAG Input Driver Module (DAOAGI) controls processing of all modules related to reading, listing, verifying, and formatting of the input OAG tape data records.

5.2.1.2 DA IBM Sort Interface Module (DASORT) modifies SORTIN and SORTOUT DCBs to reflect logical record length and block size of table to be created or merged.

5.2.1.3 Read A Block Module (DARED) reads a specified data record block from the input OAG tape.

5.2.1.4 OAG Tape Date Conversion Module (DADATE) converts EBCDIC date from the OAG tape header to internal binary representation.

5.2.1.5 Date to Week Day Module (DADAYS) calculates day of the week for the OAG tape effective date.

5.2.1.6 Convert Calendar Time to Epoch Module (APITIM) converts current Julian date and time to elapsed seconds since epoch time.

5.2.1.7 DA List Component (DA-LIST) lists the data record images from the input OAG tape.

5.2.1.8 List Error Diagnostics Component (RA-ERRMSG) lists error messages associated with validation and formatting of the OAG tape data records.

5.2.1.9 Flight Record Initial Filter Module (DAFILN) filters out international and non-flight records (aircraft class other than Jet, Turbo, Propeller, Sea Plane, Amphibians, and Helicopters) from the input OAG tape.

5.2.1.10 Duplicate Record Locator Component (DA-OAGC) validates input OAG flight record departure time data item values and flags duplicate records.

5.2.1.10.1 Duplicate Record Locator Module (DAOAGC) verifies departure time field of the input OAG flight records and finds duplicate records based on same arrival airport; departure airport; aircraft class, type, and category; aircraft identification; and departure and enroute time within the predefined delta time limit.

5.2.1.10.2 Form Conversion Component (DA-FMCV) converts from either external to internal form or vice versa,or it validates that the input value is in the data base.

5.2.1.10.2.1 External/Internal Form Conversion Module (DAFMCV) converts from either external identification to internal code form or vice versa,or it validates that the input value is in the data base.

5.2.1.10.2.2 Process DB Status Component (DA-ERRM) generates error diagnostic messages if data base retrieval errors are encountered.

5.2.1.10.2.3 List Error Diagnostic Component (RA-ERRMSG) lists an error message if the input form conversion value is invalid.

5.2.1.10.2.4 Get Table Entry Component (DB-TABT) retrieves specified data record from the specified data base data set.

5.2.1.10.2.5 Locate Keyword Component (DA-LOCT) determines the location and description of the specified data item in a data item in a data record for the specified data set.

5.2.1.11 Format Flight Record Component (DA-FORDP) formats the input OAG flight records into the OAG Flight Record Set data record format.

5.2.1.11.1 Format Flight Record Module (DAFORD) formats the input OAG flight records into the OAG Flight Record Set data record image and controls processing of all other module/components in this component.

5.2.1.11.2 Time Conversion Module (DACONV) converts the time from either hours, minutes, and seconds to seconds or vice versa.

5.2.1.11.3 Convert Airport/Operator Codes Component (DA-APCN) converts the arrival airport, departure airport, airline operator code, and aircraft identification from external to internal form or vice versa.

5.2.1.11.3.1 Convert Airport/Operator Codes Module (DAAPCN) converts from external to internal form or vice versa. For airport conversion, center code to which specified airport belongs is located. For aircraft identification case, leading zeros are stripped off from the flight accession code.

5.2.1.11.3.2 Form Conversion Component (DA-FMCV) converts from either external to internal form or vice versa.

5.2.1.11.4 Format Departure Date Mask Module (DAMASK) formats departure date mask based on frequency, effective date, and discontinue date.

5.2.1.11.5 Locate Keyword Component (DA-LOCT) determines the location and description of the specified data item in a data record for the specified data set.

5.2.1.12 Write A Record Module (DAWRT) writes a specified block to the BSAM OAG header data set.

5.2.2 Process General Table Data (DA-GINP) Component reads, lists, scans, validates, converts, and formats the raw input data records into the specified data set record format.

5.2.2.1 General Table Input Driver (DAGECO) module controls the reading of a logical record, calls DARECD to parse it and DAFOGN to format the record.

5.2.2.2 Read A Record (RAREAD) module reads the raw input data record from a specified data set into an input data buffer set.

5.2.2.3 Verify General Table Data (DA-GENVR) Component validates data item associated with keywords.

5.2.2.3.1 Input Record Descriptor (DARECD) Module creates input data record description table (CO) using valid input data items.

5.2.2.3.2 Scan A Record (RA-SCANER) Component scans input raw data record data items.

5.2.2.3.3 Repeating Group Record Descriptor (DARECG) module rearranges input repeating group data contained in the input data descriptor set (C1) from vector form to repeating group form.

5.2.2.3.4 Error Message Text Create (DA-MMCRT) Component is used to parse the error message text of 80 byte length containing imbedded blanks and to set up the input data record description set (C1). In update change mode, it retrieves the old record from data base and sets up an input data record description set in the form of old and new values to simulate a fixed length vector change.

5.2.2.3.4.1 Error Message Text (DAMMCR) Module is used to create and update the error message text of an 80 byte length containing imbedded blanks.

5.2.2.3.4.2 Locate Keyword (DA-LOCT) Component determines the location of keywords in a data record for the specified table set.

5.2.2.3.4.3 Get A Record Entry (DA-GREN) Component uses a data base management module (DB-TABT) to retrieve a record from a specified table.

5.2.2.4 Format Data Record Image (DA-FORGN) Component builds the raw input data records into the specified data base record.

5.2.2.4.1 Format General Table Record (DAFOGN) Module converts input data items from external to internal code form and translates the raw input data records into the specified data base record format.

5.2.2.4.2 Data Record Add (DA-ADD) Component performs additions to data base data records or specified data sets.

5.2.2.4.2.1 Data Record Add (DADADD) Module will add an entire new record to a data base or update an existing record by adding to a repeating group or simple vector.

5.2.2.4.2.2 Get A Record Entry (DA-GREN) Component uses a data base management module (DB-TABT) to retrieve a record from a specified table.

5.2.2.4.2.2.1 Get A Record Entry (DAGREN) Module retrieves a specified general table data record for updating purposes.

5.2.2.4.2.2.2 Get Table Entry (DB-TABT) Component retrieves the specified data record entry from the specified data base table set.

5.2.2.4.2.2.3 Process DB Status (DA-ERRM) Component lists a descriptive message of data base retrieval errors.

5.2.2.4.2.2.4 Locate Keyword (DA-LOCT) Component determines the location of status indicator in a data record for the specified table set.

5.2.2.4.2.2.5 Form Conversion (DA-FMCV) Component converts external retrieval key to its internal counterpart when necessary.

5.2.2.4.2.3 Data Description Retrieval (DADDRM) Module is called to perform one of two functions: retrieve the various descriptors of a particular record item or compare the retrieved keyword to the next keyword in the input record descriptor set.

5.2.2.4.2.4 Multivariate Locator (DA-MLOC) Component scans a record to look for any repeating group or a vector.

5.2.2.4.2.4.1 Multivariate Locator (DAMLOC) Module determines the location of a repeating group or vector in a specified data record and transfers preceding simple data items from the existing data record to the updated record.

5.2.2.4.2.4.2 Data Description Retrieval (DADDRM) Module retrieves a data item description from the data record description set.

5.2.2.3.2.5 DA Group Run (DA-GRPR) Component transfers all existing repeating groups in the old record buffer to the new record buffer.

5.2.2.4.2.5.1 DA Group Run (DAGRPR) Module controls the update processing of an existing repeating group.

5.2.2.4.2.5.2 Data Description Retrieval (DADDRM) Module retrieves the various descriptions of a particular record item.

5.2.2.4.2.5.3 Vector ADD (DA-VECA) Component determines the number of vector values to be added to the record, calculates and records the new total number of values within the vector and places them into the new record.

5.2.2.4.2.6 Repeating Group ADD (DA-GRPA) Component adds any number of complete repeating groups to an existing record.

5.2.2.4.2.6.1 The ADD Repeating Group (DAGRPA) Module is used to add new repeating groups to an existing record.

5.2.2.4.2.6.2 The Data Description Retrieval (DADDRM) Module retrieves a data item description from the data record description data set.

5.2.2.4.2.6.3 Format of General Items (DA-FOGI) Component formats and inserts data items in a specific data record.

5.2.2.4.2.8 The Vector ADD (DA-VACA) Component adds new values in a vector to an old record.

5.2.2.4.2.8.1 The Vector ADD (DAVECA) Module formats and places a vector of values into a data base data record.

5.2.2.4.2.8.2 Format General Items (DA-FOGI) Component formats and inserts data items in a specified data record.

5.2.2.4.2.9 Format Departure Data Mask (DAMASK) Module formats the frequency field into the departure data mask.

5.2.2.4.2.10 Format General Items (DA-FOGI) Component formats data items for an output record.

5.2.2.4.2.10.1 Format General Items (DAFOGI) Module converts and formats data items and places them in a specified data record.

5.2.2.4.2.10.2 Form Conversion (DA-FMCV) Component converts external form to internal form and performs validation.

5.2.2.4.2.10.3 Time Conversion (DAÇONV) Module converts a time value given in hours, minutes, and seconds to seconds.

5.2.2.4.2.10.4 Convert Calendar Time to Epoch (APITIM) Module converts date and time to elapsed seconds since epoch time.

5.2.2.4.3 The Data Record Change (DA-CHNG) Component performs changes to existing data records of a specified data set.

5.2.2.4.3.1 The Data Record Change (DADCHG) Module changes the data item values in a specified data record and controls other modules.

5.2.2.4.3.2 Get A Record Entry (DA-GREN) Component uses a data base management module (DB-TABT) to retrieve a record from a specified table.

5.2.2.4.3.3 The Data Description Retrieval (DADDRM) Module retrieves a data item description from the data record description set.

5.2.2.4.3.4 Vector Traverse (DA-VECT) Component updates an existing vector in a specified data record.

5.2.2.4.3.4.1 Vector Traverse (DAVECT) Module is utilized to update vectors in the update mode and controls other modules.

5.2.2.4.3.4.2 The Vector Run (DAVECR) Module determines the length of a vector within the old record buffer and moves it to its proper location in the buffer area used to build the new record.

5.2.2.4.3.4.3 The Format of General Items (DA-FOGI) Component formats and places data items into a new data record.

5.2.2.4.3.5 The Group Traverse (DA-GRPT) Component updates an existing repeating group in a specified data record.

5.2.2.4.3.5.1 The Group Traverse (DAGRPT) Module updates data items in an existing repeating group in a specified data record.

5.2.2.4.3.5.2 The Data Description Retrieval (DADDRM) Module is called to retrieve the various (A2) descriptors of a particular record item.

5.2.2.4.3.5.3 The Vector Traverse (DA-VECT) Component updates an existing vector in a specified data record.

5.2.2.4.3.5.4 The Format of General Items (DA-FOGI) Component formats and inserts data items in a specified data record.

5.2.2.4.3.6 The Format of General Items (DA-FOGI) Component formats and inserts data items in a specified data record.

5.2.2.4.4 The Data Delete (DA-DEL) Component is used to make deletions from an existing record or to delete an existing data record.

5.2.2.4.4.1 The Data Delete (DADDEL) Module is called to delete an entire record or elements within an existing record.

5.2.2.4.4.2 The Retrieve General Table Record (DA-GREN) retrieves a general table record for updating purposes.

5.2.2.4.4.3 The Multivariate Locator (DA-MLOC) Component scans a record to look for any repeating item (repeating group or a vector). All items encountered prior to locating a multivariate are moved from an input buffer to an output buffer.

5.2.2.4.4.4 Group Traverse (DA-GRPT) Component is used in update mode to update repeating groups.

5.2.2.4.4.5 Vector Traverse (DA-VECT) Component is used in update mode to update vectors.

5.3 The Create Component (DA-CRET) creates a new data base from the raw input data records.

5.3.1 The Flight Record Set Create Component (DA-FLGCR) creates a new OAG Flight Record Set (OF), OAG Flight Index Set (IX), OAG Flight Accession Table Set (YX), and OAG Arrival/Departure Table Set (OS). It also initializes the non-OAG Flight Record Set (NF), Non-OAG Flight Index Set (XI), Non-OAG Flight Accession Table Set (XY), Non-OAG Arrival/Departure Table Set (NS), and OAG and Non-OAG Housekeeping Table Sets (HS and HK).

5.3.1.1 Create Flight Record Data Set Driver Module (DAFLCO) creates OF, IX, YX, OS, or initializes NF, XI, XY, NS, HS, or HK Sets by using utility components in the DB Subsystem.

5.3.1.2 Create Table Component (DB-CTAB) creates an entry in the TZ Table Set for a specified data base set.

5.3.1.3 Non-OAG Flight Accession Component (DA-FATS) initializes the XY Table Set with preset data from the DA COMPOOL.

5.3.1.3.1 Non-OAG Flight Accession Create Module (DAFATS) initializes the XY Table Set in create or merge mode.

5.3.1.3.2 General Table Set Create Component (DA-GENCR) creates a new data base set.

5.3.1.3.3 Locate Keyword Component (DA-LOCT) determines the location and description of the specified data item in a data record for the specified data set.

5.3.1.3.4 Get Table Entry Component (DB-TABT) retrieves a specified record from a specified data base set.

5.3.1.3.5 Process DB Status Component (DA-ERRM) generates error diagnostic message if errors are encountered during NO data set data record retrieval.

5.3.1.3.6 Write Error Diagnostics Component (RA-ERRMSG) lists a specified error message associated with initializing the XY Set.

5.3.1.3.7 Direct Access Read Interface Component (EX-DARI) reads a specified data block from a specified data base set.

5.3.1.3.8 Direct Access Write Interface Component (EXDAWI) writes a specified data block to a specified data base set.

5.3.1.3.9 Delete Table Component (DB-DTAB) deletes specified data set entry from the TZ Set.

5.3.1.4 Process DB Status Component (DA-ERRM) generates error diagnostic message if errors are encountered during OK or PK Data Sets data record retrieval.

5.3.1.5 Arrival/Departure Sets Create Component (DA-ADTS) creates the OAG or Non-OAG Arrival/Departure data sets (OS or NS).

5.3.1.5.1 Initialize OAG/Non-OAG Arrival/Departure Sets Module (DAADTS) controls initialization of the OS or NS data base sets.

5.3.1.5.2 Locate Keyword Component (DA-LOCT) determines the location and description of the specified data item in a data record for the specified data set.

5.3.1.5.3 Get Table Entry Component (DB-TABT) retrieves a specified data record from the AJ or CP data base sets.

5.3.1.5.4 General Table Set Create Component (DA-GENCR) creates a specified data base set from the formatted data records.

5.3.1.5.5 Process DB Status Component (DA-ERRM) generates error diagnostic message if retrieval errors are encountered during the AJ or CP data records.

5.3.1.5.6 Write Error Diagnostics Component (RA-ERRMSG) lists a specified error message associated with initializing the OS or NS Sets.

5.3.1.5.7 Delete Table Component (DB-DTAB) deletes specified data set entry from the TZ Set.

5.3.1.6 Read A Record Module (RAREAD) reads a next logical data record from a specified sequential data set.

5.3.1.7 Create Flight Record Set Component (DB-CFRS) inserts OAG flight records into the OF Set and updates related data sets IX, YX, and OS with index information.

5.3.1.8 Retrieve Flight Record Component (DB-GETR) retrieves a specified flight record from the OF or NF data base sets.

5.3.1.9 Insert Flight Record Component (DB-INST) inserts new flight records into the NF data base set.

5.3.1.10 Locate Keyword Component (DA-LOCT) determines the location and description of the specified data item in a data record for the specified data set.

5.3.1.11 Get Table Entry Component (DB-TABT) retrieves a specified data record from the OK or PK data base sets.

5.3.1.12 Set Table Entry Component (DB-SETO) updates the PT data set with a specified data record.

5.3.1.13 Delete Table Component (DB-DTAB) deletes specified data set entry from the TZ Set.

5.3.2 The General Table Set Create Component (DA-GENCR) creates a new data base containing all CFC data base sets.

5.3.2.1 The General Table Create Driver Module (DAGECR) initializes the Table Mapping Table Set TZ, creates a specified data set, and updates the TZ Set with specified data set entry.

5.3.2.2 Locate Keyword Component (DA-LOCT) determines the location and description of the specified data item in a data record for the specified data set.

5.3.2.3 Create Table Component (DB-CTAB) creates an entry into the TZ Set for the specified data set and initializes the specified data base set.

5.3.2.4 Read A Record Module (RAREAD) reads a next logical data record from the specified sequential data set.

5.3.2.5 Create Table Entry Component (DB-CTBE) inserts a given data record into a specified general table set.

5.3.2.6 Process DB Status Component (DA-ERRM) generates error diagnostic message if data base access errors are encountered.

5.3.2.7 Delete Table Component (DB-DTAB) deletes a specified data set entry from the TZ Set.

5.3.2.8 Write Error Diagnostic Component (RA-ERRMSG) lists diagnostic messages if specified data set is already created.

5.4 Merge Component (DA-MERG) merges new OAG records with the existing data base OF Set and performs cleanup operations for the data base OF, OK, and NF Sets.

5.4.1 Merge Flight Record Driver Module (DAMERC) controls processing of all modules related to merging the new OAG flight records with the existing data base OF and those modules related to the cleanup of the data base OF and NF Sets.

5.4.2 Convert Calendar Time to Epoch Module (APITIM) converts current Julian date and time to elapsed seconds since epoch time.

5.4.3 Convert Epoch Time to Calendar Format Module (APETIM) converts elapsed seconds since Epoch to a calendar date and hours, minutes, and seconds.

5.4.4 Data Set Item Location Component (DA-LOCT) determines the location and description of the specified data item in a data record for the specified data set.

5.4.5 Date to Week Day Module (DADAYS) calculates day of the week for the new effective data base date.

5.4.6 Clean Flight Record Data Set Component (DA-OFCL) controls cleanup operations for the OF or NF Sets.

5.4.6.1 Clean Flight Record Module (DAOFCL) performs cleanup operations for the OF or NF Sets.

5.4.6.2 Locate Keyword Component (DA-LOCT) determines the location and description of the specified data item in a data record for the specified data set.

5.4.6.3 DA IBM Sort Interface Module (DASORT) modifies SORTIN and SORTOUT DCBs to reflect logical record length and block size of table to be merged.

5.4.6.4 Retrieval of Flight Record (DA-GTFR) Component retrieves a flight record corresponding to given retrieval specifications.

5.4.6.4.1 Flight Record Retrieval (DAGTFR) Module controls reading and selecting flight records.

5.4.6.4.2 Convert Airport and Operator Code Values (DA-APCN) Component converts arrival/departure airports, aircraft identification, and airline operator external values to internal values. This module also finds center for airports and converts to internal values.

5.4.6.4.3 Get Flight Record (DB-GETR) Component retrieves a flight record from the OF or NF Sets.

5.4.6.4.4 Get Next Flight Record (DB-GETE) Component retrieves the next flight record that satisfies the identification criteria established by the last DB-GETR call.

5.4.6.4.5 The Process DB Status (DA-ERRM) Component generates diagnostic messages if data base retrieval errors are encountered.

5.4.6.4.6 The Locate Keyword (DA-LOCT) Component determines the location of the retrieval key in a data record for the specified table set.

5.4.6.4.7 Write Error Diagnostic (RA-ERRMSG) Component writes an error message if invalid input data is encountered.

5.4.6.5 Convert Airport/Operator Codes Module (DAAPCN) converts from external to internal form or vice versa. For airport conversion, center code to which specified airport belongs is located. For aircraft identification case, leading zeros are stripped off from the flight accession code.

5.4.6.6 Sort (RA-SORT) Component interfaces with the IBM SORT module to sort data records in the specified order.

5.4.7 Open a File (RAOPEN) Module opens the user-specified SORTIN or SORTOUT file depending on what flight record set is being processed.

5.4.8 Create Flight Record (DA-FLGCR) Component controls creation of specified flight records and related data base sets.

5.4.9 Merge Flight Record (DA-MRGE) Component controls merging of new OAG records with existing data base records.

5.4.9.1 Merge Flight Record Driver Module (DAMRGE) controls merge processing of the OAG Flight record set.

5.4.9.2 Open A File (RAOPEN) Module opens existing SORTIN or SORTOUT flight record data set.

5.4.9.3 Locate Keyword Component (DA-LOCT) determines the location and description of the specified data item in a data record for the specified data set.

5.4.9.4 Compare flight records (DA-FLCMPR) Component controls the merging of records with equal Aircraft IDs from the existing flight record set with OAG tape records.

5.4.9.4.1 Compare Flight Records (DACMPR) Module merges records with equal Aircraft IDs from the existing flight record set with OAG tape records.

5.4.9.4.2 Locate Keyword Component (DA-LOCT) determines the location and description of the specified data item in a data record for the specified data set.

5.4.9.4.3 Create Flight Record Data Set (DAFLGCR) Component controls the placing of flight records into data base.

5.4.9.5 List Error Diagnostics (RA-ERRMSG) Component lists a specified error message associated with merging of the OF Set.

5.4.9.6 Read A Record Module (RAREAD) reads a record from SORTOUT data set containing old or new OAG tape records.

5.4.9.7 Create Flight Record (DA-FLGCR) Component controls the placing of merged records into new flight record set.

5.4.10 Process OAG Input Data Component (DA-OAGINP) reads, lists, validates, converts, and formats the input OAG tape flight records into the OAG flight record set data record format.

5.4.11 Sort (RA-SORT) Component interfaces with the IBM SORT Module to sort data records in the specified order.

5.4.12 List Error Diagnostics (RA-ERRMSG) Component lists a specified error message associated with merging the OAG flight record set or cleaning OAG or Non-OAG flight record sets.

5.5 The Update (DA-UPD) Component provides the capability to update the CFC data base sets by adding, changing, or deleting records.

5.5.1 The Flight Record Set Update (DA-FLGUP) Component adds, changes, or deletes records in the OF or NF Sets using utility components of the DB Subsystem.

5.5.1.1 The Flight Record Update Driver (DAFLUP) Module controls processing of all modules related to adding, changing, or deleting records in the flight record sets.

5.5.1.2 The Locate Keyword (DA-LOCT) Component determines the location of the retrieval key in a data record for the specified table set.

5.5.1.3 Convert Airport and Operator Codes (DA-APCN) Component performs external to internal conversions.

5.5.1.4 The Update Flight Record (DB-UPFR) Component changes, deletes, and adds to flight records.

5.5.1.5 List (DA-LIST) Component is called to list the updated flight records.

5.5.1.6 The Process DB Status (DA-ERRM) Component generates diagnostic messages if data base retrieval errors are encountered.

5.5.1.7 Change Flight Record (DA-FRCG) Component performs change updates to data items in flight records.

5.5.1.7.1 Change Flight Record (DAFRCG) Module is the driver of several modules used to change the flight records.

5.5.1.7.2 Data Description Retrieval (DADDRM) Module retrieves descriptive information about a flight record set data item from the data record description set.

5.5.1.7.3 Format of General Items (DA-FOGI) Component formats data from external form to internal form and places it in a specified output record.

5.5.1.7.4 Get Flight Record (DB-GTFR) Component retrieves a flight record that meets specified criteria.

5.5.1.7.5 Update Flight Record (DB-UPFR) Component updates a specified flight record.

5.5.1.7.6 Data Base Error Status (DA-ERRM) Component processes data base retrieval errors by printing an error message.

5.5.1.7.7 List (DA-LIST) Component lists the changed flight record.

5.5.1.7.8 List Error Diagnostic (RA-ERRMSG) Component writes an error message if invalid input data was encountered.

5.5.1.7.9 Convert Airport and Operator Code Values (DA-ABCN) Component converts arrival/departure airport, aircraft identification, and airline operator external values to internal values. This module also finds center for airports and converts to internal values.

5.5.1.7.10 The Locate Keyword (DA-LOCT) Component determines the location of the retrieval key in a data record for this specified table set.

5.5.1.8 The Delete Table (DB-DTAB) Component deletes a specified table set entry from the TZ Set.

5.5.1.9 The List Error Message (RA-ERRMSG) Component lists diagnostic messages if the retrieval key locator cannot be determined.

5.5.1.10 Retrieval Flight Records (DA-GTFR) Component retrieves a flight record corresponding to given retrieval specifications.

5.5.2 The General Table Update (DA-GENUP) Component adds, changes, or deletes records in the General Table Set by using utility components in the DB Subsystem.

5.5.2.1 The General Table Update Driver (DAGENU) Module controls processing of all modules related to adding, changing, or deleting of records in sets associated with general tables.

5.5.2.2 The Locate Keyword (DA-LOCT) Component determines the location of the retrieval key in a data record for the specific table set.

5.5.2.3 The List Error Diagnostic (RA-ERRMSG) Component lists diagnostic messages if the retrieval key locator cannot be determined.

5.5.2.4 The Create Table Entry (DB-CTBE) Component inserts a given data record into the specified table set.

5.5.2.5 The Process DB Status (DA-ERRM) Component generates diagnostic messages if data base retrieval errors are encountered.

5.5.2.6 The Delete Table (DB-DTAB) deletes a specified table set entry from the TZ Set.

5.5.2.7 The Set Table Entry (DB-SETO) Component replaces the current data record entry for the specified key with a new data record entry.

5.5.2.8 The List (DA-LIST) Component formats and lists the specified updated data records.

6.0 The List Component (DA-LIST) provides the capability to generate formatted listings of requested data base records, control cards, and raw data records.

6.1 The List Control Module (DALICO) controls processing of all modules related to the listing of formatted data base records, input control card images, and input data set images.

6.2 Data Set Listings Component (DA-LISL) is called to list any or all records that belong to a CFC data base data set.

6.2.1 The List Output Driver (DALISL) Module is called to separately process the listing of a core resident updated record or one or more disk resident CFC data base records.

6.2.2 The Process DB Status (DA-ERRM) Component generates diagnostic messages if data base retrieval errors are encountered.

6.2.3 Retrieval Flight Record (DA-GTFR) Component retrieves a flight record corresponding to given retrieval specifications.

6.2.4 Data Record Formatting (DA-FORT) Component formats data records into a structured printout arrangement.

6.2.4.1 Data Format Driver (DAFORT) Module controls the formatting of items, vectors, and repeating groups into printable EBCDIC form.

6.2.4.2 Item Formatting (DA-ITFM) Component formats data record items into a structured printout form.

6.2.4.2.1 Format Data Record Items (DAITFM) Module is the driver for this component.

6.2.4.2.2 Item Conversion (DA-ITCN) Component provides the conversions necessary to convert from internal to external EBCDIC units.

6.2.4.2.2.1 Convert Items From Internal to External Formats (DAITCN) Module converts items in a data record from internal to EBCDIC codes.

6.2.4.2.2.2 Time Conversion (DACONV) Module converts a time value given in seconds to hour, minutes, and seconds.

6.2.4.2.2.3 External/Internal Form Conversion (DA-FMCV) Component converts from internal to external form.

6.2.4.2.2.4 Convert Epoch Time to Calendar (APETIM) Module converts a time in seconds to its corresponding date.

6.2.4.3 Vector Formatting (DA-VCFM) Component handles conversion and formatting of vectors.

6.2.4.3.1 Format Data Record Vectors (DA-VCFM) Module formats simple vectors and vectors within repeating groups.

6.2.4.3.2 Item Conversion (DA-ITCN) Component provides the conversions necessary to convert from internal to external EBCDIC units.

6.2.4.4 Repeating Group Formatting (DA-RGFM) Component handles conversion and formatting of repeating groups.

6.2.4.4.1 Format Data Record Repeating Groups (DARGFM) Module formats and converts repeating groups and controls other modules.

6.2.4.4.2 Format Data Record Items (DA-ITFM) Component formats data record items into a structured printout form.

6.2.4.4.3 Format Data Record Vectors (DA-VBFM) Component assists in the listing of data records by formatting simple vectors and vectors in repeating groups.

6.2.5 Header Listing and Pagination (DA-LISP) Component controls output listing pagination and page header output.

6.2.6 The GET Table Entry (DB-TABT) Component (a utility component in the DB Subsystem) retrieves specified conversion data record entry from the specified table sets.

6.2.7 Write A Record (RAWRIT) Module (a module in the RA Component) outputs the specified data record in the specified device.

6.2.8 List Error Diagnostics (RA-ERRMSG) Component lists a specified error message associated with data base retrieval or internal to external form conversion processing.

6.2.9 Data Set Item Location (DA-LOCT) Component determines the location and description of the specified data item in a data record for the specified data set.

6.3 Header Listing and Pagination (DA-LISP) Component controls output listing pagination and page header output.

6.3.1 Header Listing and Pagination (DALISP) Module monitors output page usage, forces a page eject, and writes page headers.

6.3.2 Write A Record (RAWRIT) Module writes a record to the specified output device.

6.4 Write A Record (RAWRIT) Module writes the specified data record to the specified device.

6.5 List Error Diagnostics (RA-ERRMSG) Component lists a diagnostic message if a data base retrieval error is encountered.

6.6 External/Internal Form Conversion (DA-FMCV) Component converts the retrieval key value from external to internal form.

2.2.2.3 System Testing Subsystem

The System Testing subsystem, as depicted in the hierarchial diagram of Figure 2.2.2-10, includes the JOVIAL Automated Verification System (JAVS) Component, the Test Case Generator Component, and the Online Test Director Component. The JAVS Component serves to facilitate and enhance the exhaustive testing of modules and the probabilistic testing of components. After a module coded in JOVIAL has been successfully compiled, it is subjected to the JAVS process. The process analyzes the module structure and generates a JAVS library element of the module. Decision-to-decision (DD) paths are identified that provide an audit trail for successful testing. Probes may be inserted at strategic points in the module for capturing intermediate values. After generating a test set, the user executes the target module and derives another report from JAVS that will identify the degree of success of the test relative to all DD paths.

The functional sequencing of the JAVS Component is depicted in Figure 2.2.2-11.

The Test Case Generator Component provides the capability to simulate any of the CFC message traffic to be processed by the OPCX. Using user-specified controls, a series of test cases are developed from user-coded inputs and/or from message traffic recorded by the OPCX. This test message tape file is employed by the Online Test Director Component to completely test the OPCX capabilities at the complex level, including all error message paths.

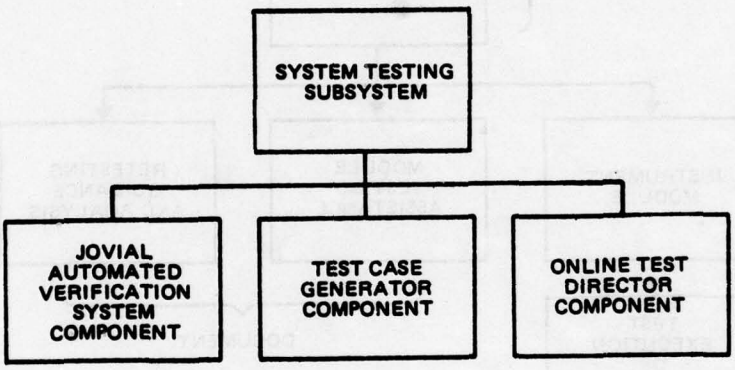


Figure 2.2.2-10. System Testing Subsystem Hierarchial Diagram

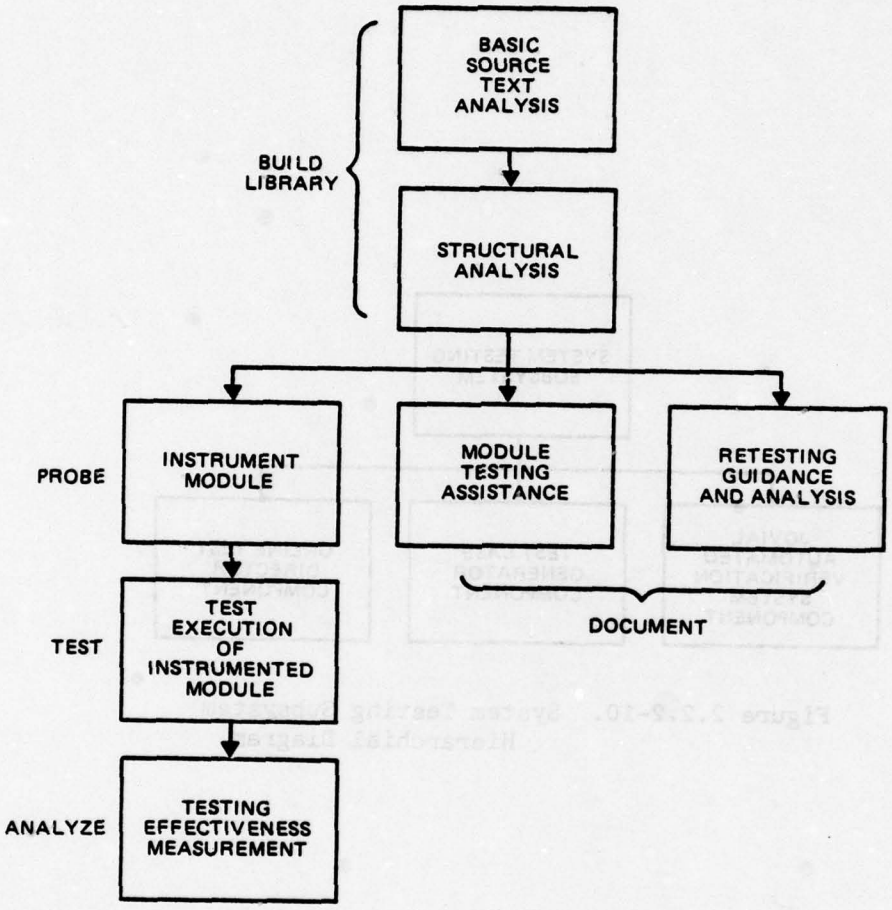


Figure 2.2.2-11. JA Component Logical Sequence

The Online Test Director Component provides the capability to replay a series of test cases through the OPCX for complex-level testing. Provisions are made to test online operations (time interval message input) and to test the OPCX under full loading conditions (untimed interval message input) for subsequent performance analysis using the Data Reduction and Analysis Component. The CSI Component of the Test Case Generator Component is a functional part of the Executive Subsystem of the OPCX and is physically located such that all OPCX software can be evaluated. The remaining components of the Test Case Generator Component run as a transaction component under the OPCX EX.

2.2.2.3.1 JOVIAL Automated Verification System (JAVS) Component

The JAVS Component is a tool to facilitate the testing of JOVIAL Modules and components. The purpose of the component is to analyze the decision-to-decision (DD) paths traversed for a given test of a module or component. In addition, the JAVS Component provides the capability to insert probes at strategic points in a module for capturing intermediate values. By generating tests and examining the resultant JAVS reports, the user can identify the portions of the module code that are frequently used as well as those portions that have not been tested.

The JAVS Component was produced under contract for the U. S. Air Force at the Rome Air Development Center (RADC) and furnished to CSC by the FAA. The delivered version was developed using the J3 dialect of JOVIAL; the Government-furnished dialect of the JOVIAL Compiler is J2. Therefore,

the JAVS was transliterated to J2. This process included converting the source code from Honeywell to IBM format, building a library of common procedures, translating code, compiling, and linking. In addition, the compiler and machine dependencies inherent to the JAVS-2 Component were incorporated. The JAVS User's Manual, Programmer's Guide, and design documents were updated to reflect the work performed.

2.2.2.3.2 Test Case Generator (TR) Component

a. Purpose. The purpose of the Test Case Generator Component is to generate CFC simulation tapes that provide the capability of operating the OPCX in a controlled environment as specified in CPFS Volume III, Offline Support Subsystem Specification.

b. Component Overview. The Test Case Generator Component generates simulation tapes that have the function of completely testing the Operational Software Complex exclusive of its communications interfaces. The generated simulation tape contains simulated or actual CFC Archive Log Queue messages sorted by message transmission time. The user of the simulation function is capable (through the use of user-supplied control parameters) of generating offline any desired scenario for subsequent testing of the OPCX. The generated simulation tape is used as input to the CFC Monitor to simulate live inputs to the System. The Test Case Generator Component processes source messages on either cards or tape and creates a simulation tape containing each type of simulated data in a format compatible with CFC Monitor operation. The three major capabilities of the Test Case Generator Component include:

- Generation of a CFC simulation tape
- Merging of two CFC simulation tapes
- Formatted listings of CFC simulation tapes

An overview of the Test Case Generator Component is shown in Figure 2.2.2-12.

c. Functional Description. The Test Case Generator Component reads the user-supplied control cards from the card reader via the

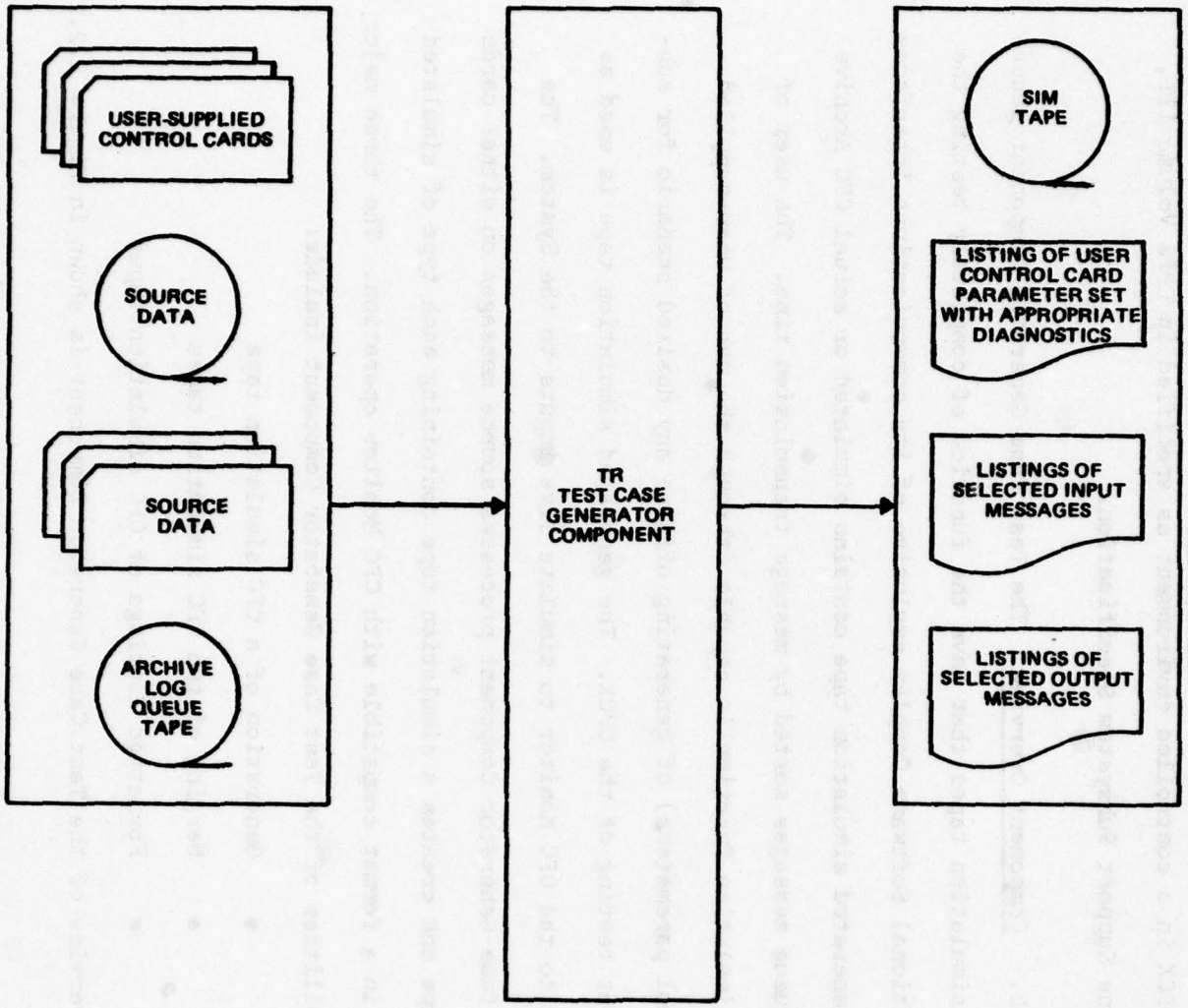


Figure 2.2.2-12. TR-1.0 Test Case Generator Component (TR) System Level Overview

services provided by OS/9020. The parameters obtained from the control cards enable the main driver modules to control processing and are also used to build message type selection tables. The source messages to be written to the simulation tape are read from the I/O device specified, which is either a card file or a tape file. The user-supplied control cards specify the functions to be performed:

- CFC simulation tape
- Tape merge
- Tape print

For CFC simulation tape generation, the source messages are written out to a generated CFC simulation tape. For a merged simulation tape request, two simulation tapes are merged into one simulation tape. When the user requests the print function, a simulation tape is printed selectively to generate a formatted report.

Two types of reports are printed for any of the simulation tape generation functions. These reports include source messages input to the simulation, and selected messages written to the generated simulation tape.

d. Inputs. The control of the Test Case Generator Component is via a set of user-supplied control cards that are read in prior to execution of one of the main processing components. The control cards required from the user specify the function to be performed; the location of the source messages for the simulation tape or of the simulation tape to be printed; the simulation start/stop time; the simulation tape header information; a series of message types, a time interval to build the message type selection table, and sort parameters.

The source messages are the other major input to the Test Case Generator Component.

e. Outputs. The output of the Test Case Generator Component is a CFC simulation tape. Listings include selected input messages to the simulation, selected output messages (those written to the simulation tape), and any invalid input message type along with its associated diagnostics. The control card images are also printed along with any diagnostics to indicate erroneous parameters. The simulation tape print function will print a formatted report of selected messages from the simulation tape. These outputs to the printer will be via the HASP capabilities of OS/9020.

2.2.2.3.2.1 Major Components

The Test Case Generator Component consists of two major components: the Process Control Card Component and the Tape Generation Component.

a. Process Control Cards Component. This component reads user-supplied control cards, verifies them, echo-prints the card images with any appropriate diagnostics, and generates message type selection tables.

b. Generate Sim Tape Component. The Generate Sim Tape Component controls the processing of the selection criteria of the three basic functions of the Test Case Generator Component. These three basic functions are: the CFC simulation tape generation, the merged simulation tape generation, and a selective listing of a simulation tape.

2.2.2.3.2.2 Process Control Cards Component

a. Purpose. The purpose of the Process Control Cards Component is to read user-supplied control cards that will determine the type of processing to take place within the Test Case Generator Component.

b. Functional Description. The function to be performed by the Process Control Cards Component is to read all the user-supplied control cards. The function requests are to generate a CFC simulation tape, tape merge, and tape print. The end of the function request is signaled by a TERM card. Each parameter is checked for validity. The card images are printed with applicable diagnostics. Valid control card parameters are converted into the necessary message type selection tables.

The Process Control Cards Component reads user-supplied control cards from the job stream. Cards are read until a TERM card is encountered. The component will then examine the parameters for validity. Invalid parameters cause the Test Case Generator Component to terminate. The user-supplied control card images are then printed along with any appropriate diagnostic. Assuming there are no errors in the control cards, the component will build the necessary message type selection tables.

c. Input. The control card reading process occurs once per invocation of the Test Case Generator Component.

d. Output. The output of the Process Control Cards Component will be a listing of the user-supplied control card images with any

appropriate diagnostics. Internal outputs include the message selection tables.

2.2.2.3.2.3 Generate Sim Tape Component

The purpose of the Generate Sim Tape Component is to do the processing necessary to fulfill the function requested by the user. The three functions that may be selected are:

- CFC simulation tape generation
- Tape merge
- Tape print

2.2.2.3.2.3.1 Generate CFC Sim Tape Component

a. Purpose. The purpose of the Generate Sim Tape Component is to create a simulation tape from the input message data.

b. Functional Description. The function of the component is to read source messages and write the messages to the CFC simulation tape. First the CFC simulation tape header record is created from the user-supplied CFC header information set. The created header record is then written out to the CFC simulation tape to be generated. The main processing loop consists of reading input CFC message buffer sets and writing message buffer sets to the CFC simulation tape. The processing loop continues until all input messages have been processed. Messages written to the CFC simulation tape may be listed selectively.

c. Inputs. Inputs to the component are the CFC messages from either card or tape, CFC simulation tape header information, the message

type selection tables, and other user-supplied control parameters.

d. Outputs. The outputs of this component are a CFC simulation tape, formatted listings of input messages to the CFC simulation, and selected output messages.

2.2.2.3.2.3.2 Tape Merge Component

a. Purpose. The purpose of the Tape Merge Component is to merge two simulation tapes into a combined simulation tape.

b. Functional Description. The Tape Merge Component merges selected messages from the two input CFC simulation tapes. Selected portions of the merged simulation tape may be optionally retrieved and listed.

First, the simulation tape header record is created from the user-supplied control information set. The created header record is then written out to the merged simulation tape to be generated. Selected portions of the combined simulation tape may be retrieved, stored in a print file, sorted by user-specified criteria, and listed.

c. Inputs. Inputs to the Tape Merge Component are the two CFC simulation tapes to be merged, message type selection tables, and the simulation tape header information.

d. Outputs. The output of this component is a merged CFC simulation tape consisting of messages selected from the specified input tapes, and a selective listing of output messages.

2.2.2.3.2.3.3 Print Sim Tape Component

a. Purpose. The purpose of the Print Sim Tape Component is to print a formatted report of a simulation tape according to a user-supplied list of specifications.

b. Functional Description. The function of the component is to store in a work area selected messages from the simulation tape to be eventually printed. The work area will be sorted, and a formatted report will be printed from the sorted work area.

The basic processing loop consists of reading a message buffer set from the CFC simulation tape to be printed, and moving those messages specified by user-supplied list specifications to a work area. The loop will continue until the entire simulation tape to be printed has been read. The work area (consisting of those selected messages to be printed) may optionally sorted according to user-supplied SORT parameters. A listing will then be generated from the sorted work area.

c. Inputs. Inputs to the component will be the CFC simulation tape to be printed, message type selection tables, and sort parameters.

d. Outputs. The output from the component is a listing of the simulation tape according to a user-supplied list of specifications.

The Visual Table of Contents for the TR Component is shown in Figure 2.2.2-13.

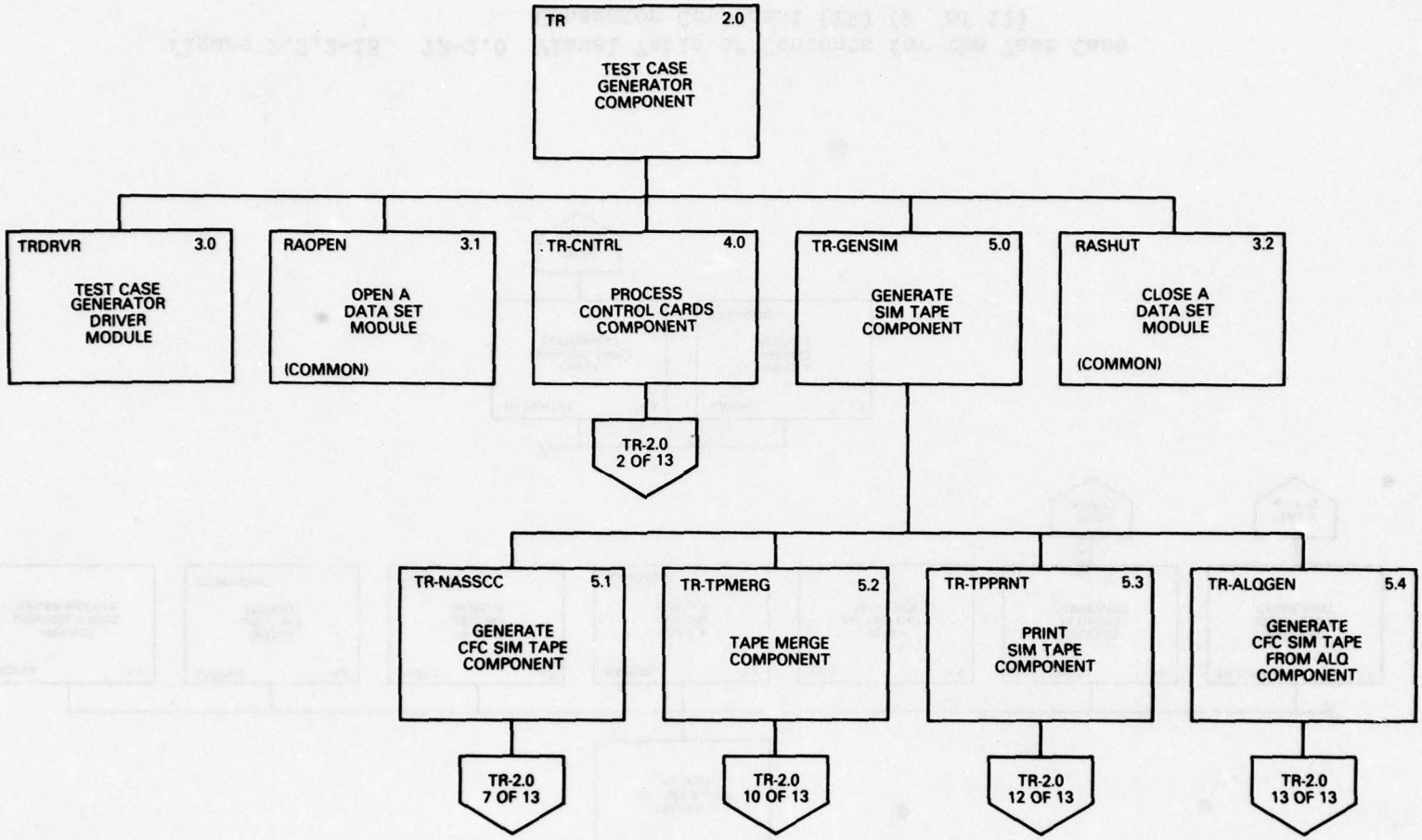


Figure 2.2.2-13. TR-2.0 Visual Table of Contents for the Test Case Generator Component (TR) (1 of 13)

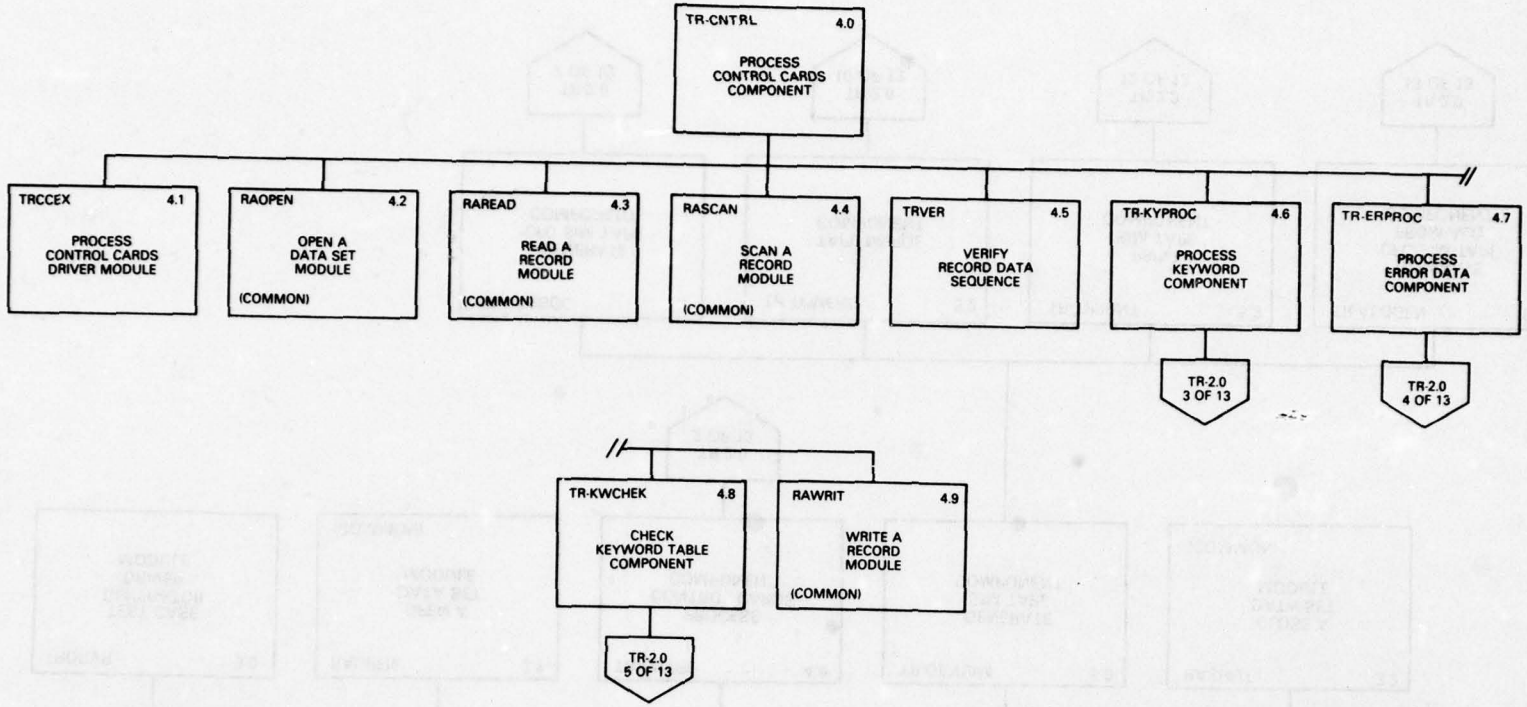


Figure 2.2.2-13. TR-2.0 Visual Table of Contents for the Test Case Generator Component (TR) (2 of 13)

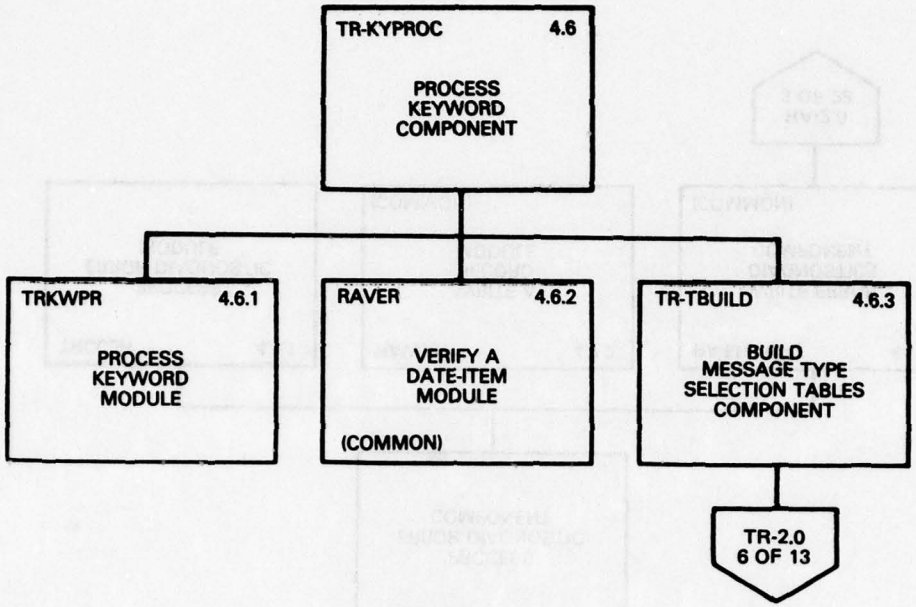


Figure 2.2.2-13. TR-2.0 Visual Table of Contents for the Test Case Generator Component (TR) (3 of 13)

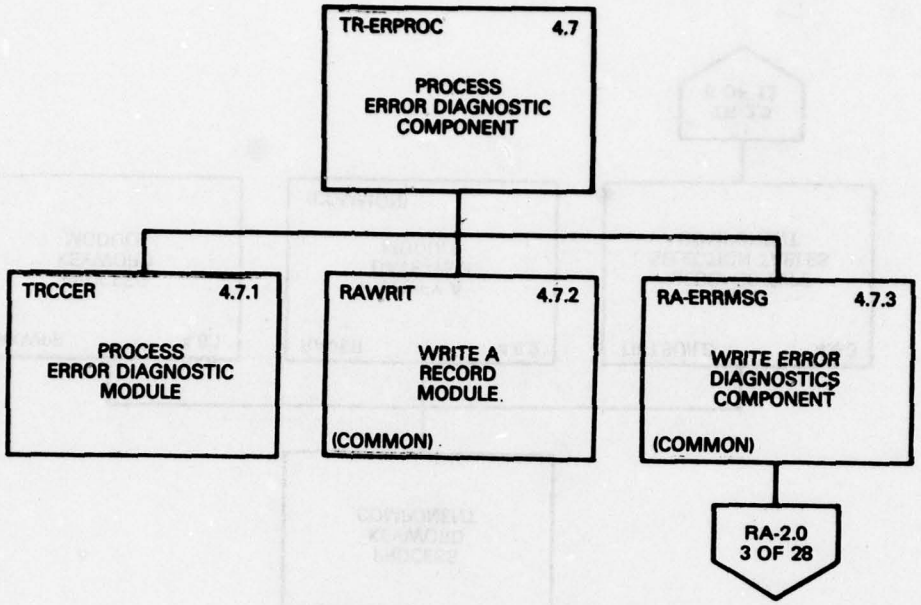


Figure 2.2.2-13. TR-2.0 Visual Table of Contents for the Test Case Generator Component (TR) (4 of 13)

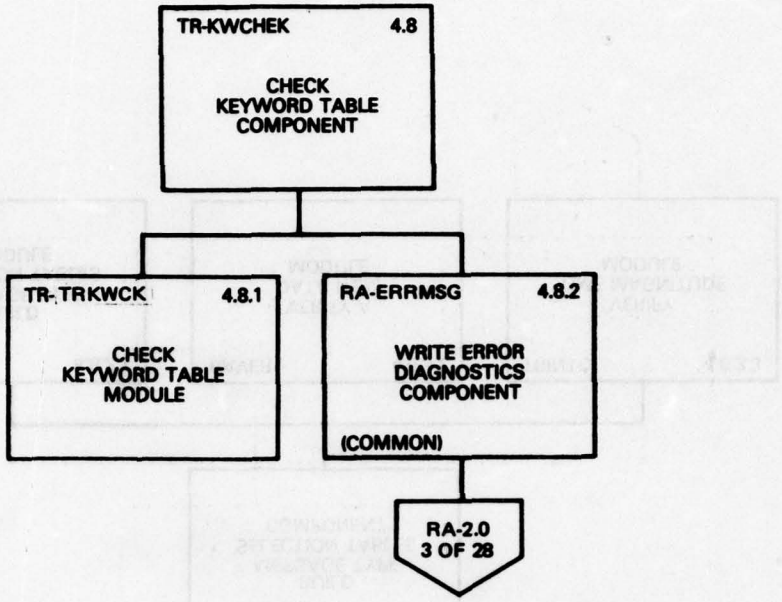


Figure 2.2.2-13. TR-2.0 Visual Table of Contents for the Test Case Generator Component (TR) (5 of 13)

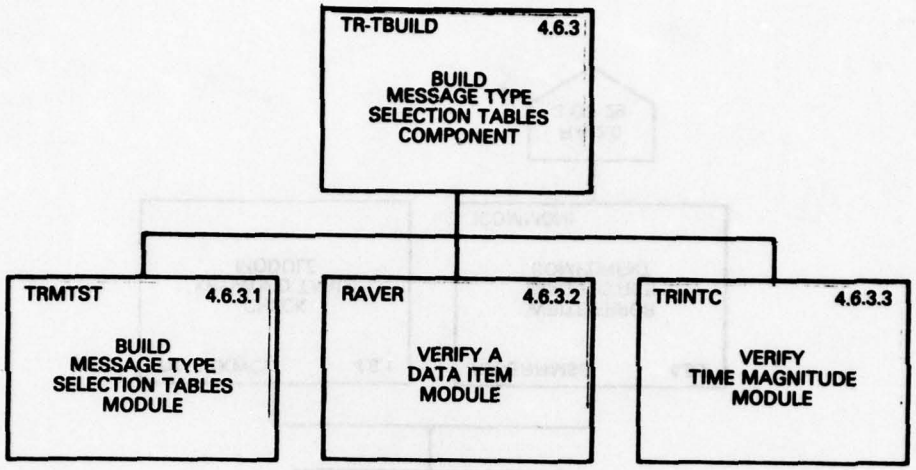
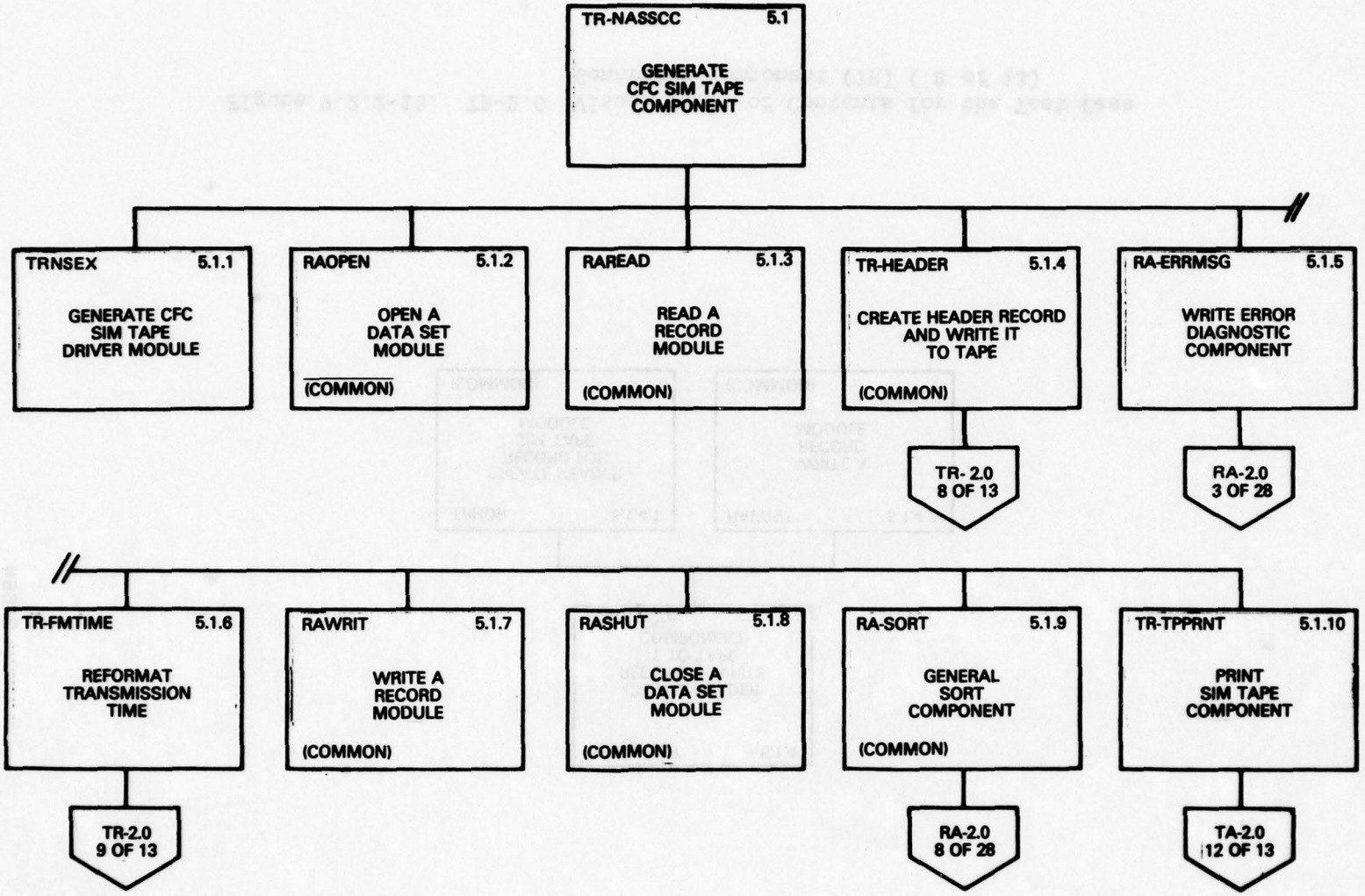


Figure 2.2.2-13. TR-2.0 Visual Table of Contents for the Test Case Generator Component (TR) (6 of 13)


TR-NASSCC 5.1
GENERATE CFC SIM TAPE COMPONENT
TRNSEX 5.1.1
GENERATE CFC SIM TAPE DRIVER MODULE
RAOPEN 5.1.2
OPEN A DATA SET MODULE
(COMMON)
RAREAD 5.1.3
READ A RECORD MODULE
(COMMON)
TR-HEADER 5.1.4
CREATE HEADER RECORD AND WRITE IT TO TAPE
(COMMON)
RA-ERRMSG 5.1.5
WRITE ERROR DIAGNOSTIC COMPONENT
TR- 2.0 8 OF 13
RA-2.0 3 OF 28
TR-FMTIME 5.1.6
REFORMAT TRANSMISSION TIME
RAWRIT 5.1.7
WRITE A RECORD MODULE
(COMMON)
RASHUT 5.1.8
CLOSE A DATA SET MODULE
(COMMON)
RA-SORT 5.1.9
GENERAL SORT COMPONENT
(COMMON)
TR-TPPRNT 5.1.10
PRINT SIM TAPE COMPONENT
TR-2.0 9 OF 13
RA-2.0 8 OF 28
TA-2.0 12 OF 13

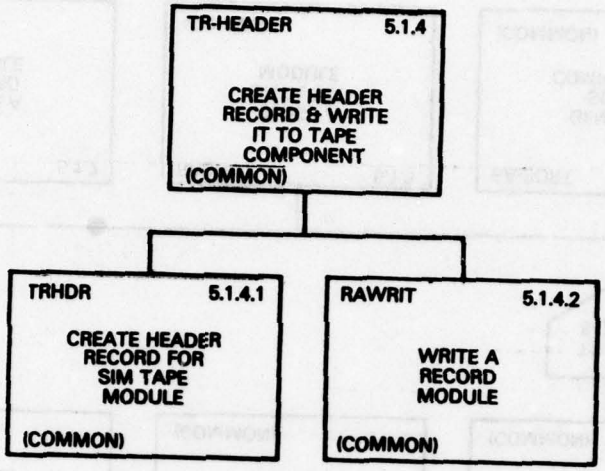


Figure 2.2.2-13. TR-2.0 Visual Table of Contents for the Test Case Generator Component (TR) (8 of 13)

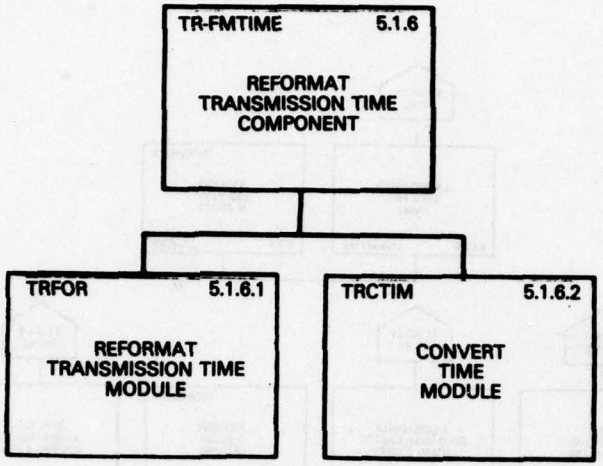


Figure 2.2.2-13. TR-2.0 Visual Table of Contents for the Test Case Generator Component (TR) (9 of 13)

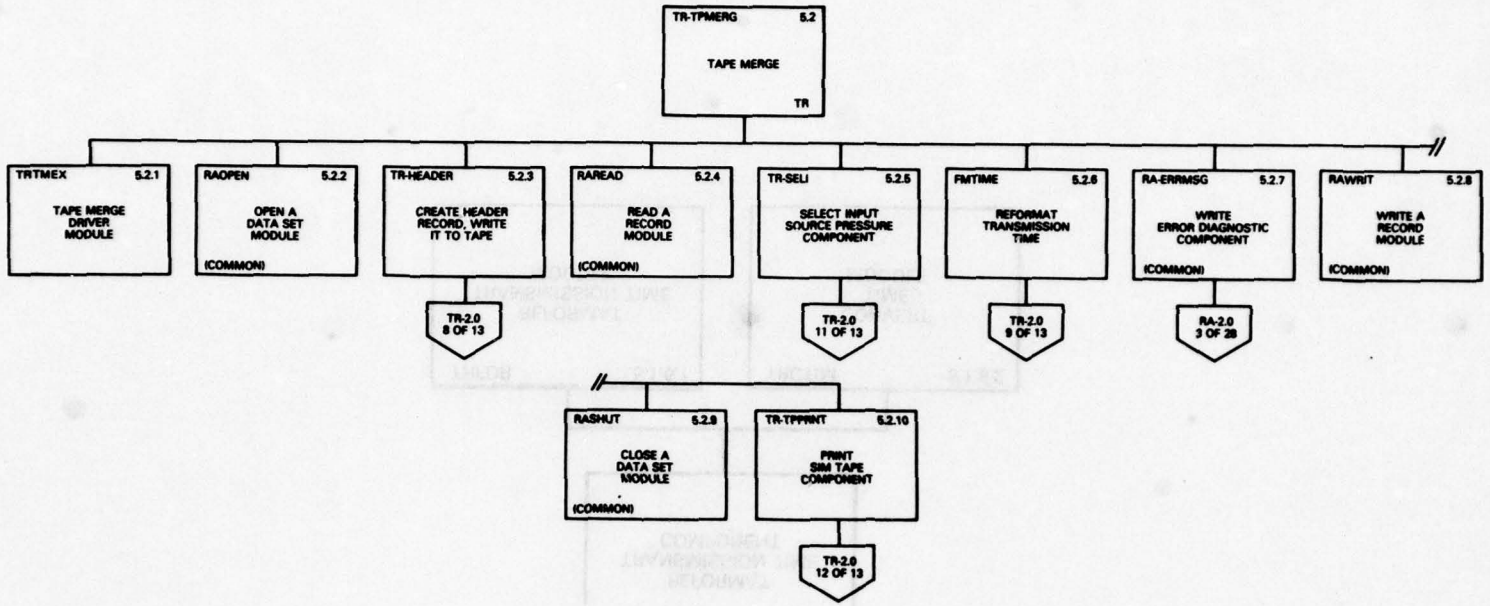


Figure 2.2.2-13. TR-2.0 Visual Table of Contents for the Test Case Generator Component (TR) (10 of 13)

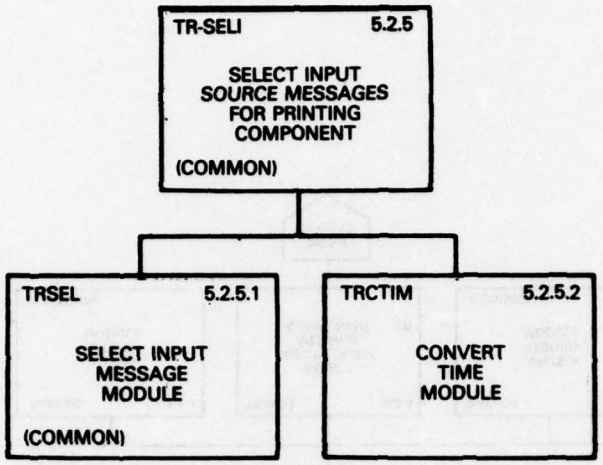


Figure 2.2.2-13. TR-2.0 Visual Table of Contents for the Test Case Generator Component (TR) (11 of 13)

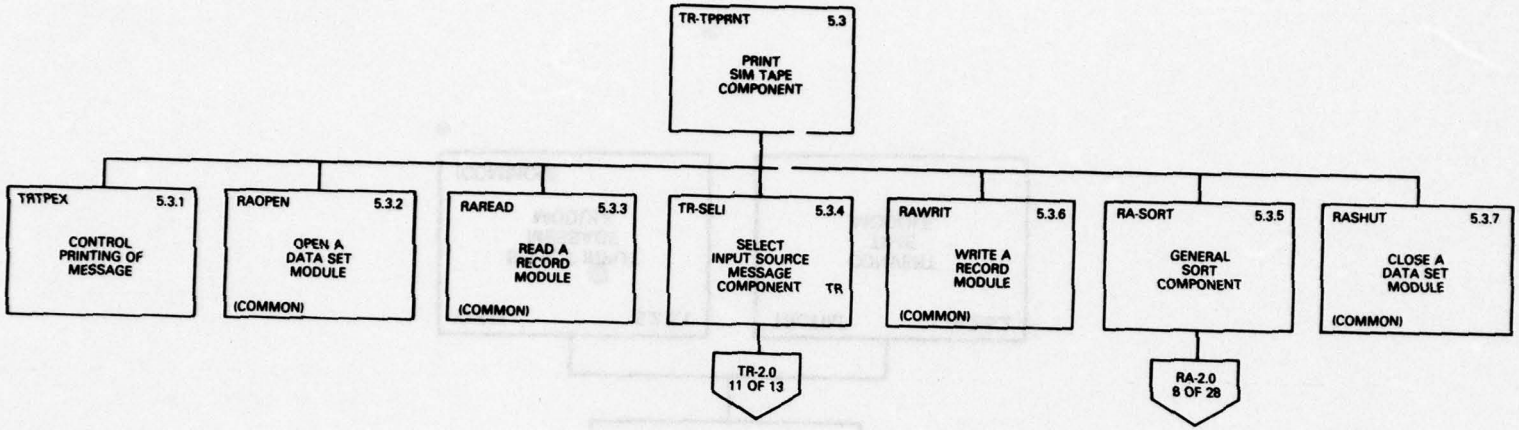


Figure 2.2.2-13. TR-2.0 Visual Table of Contents for the Test Case Generator Component (TR) (12 of 13)

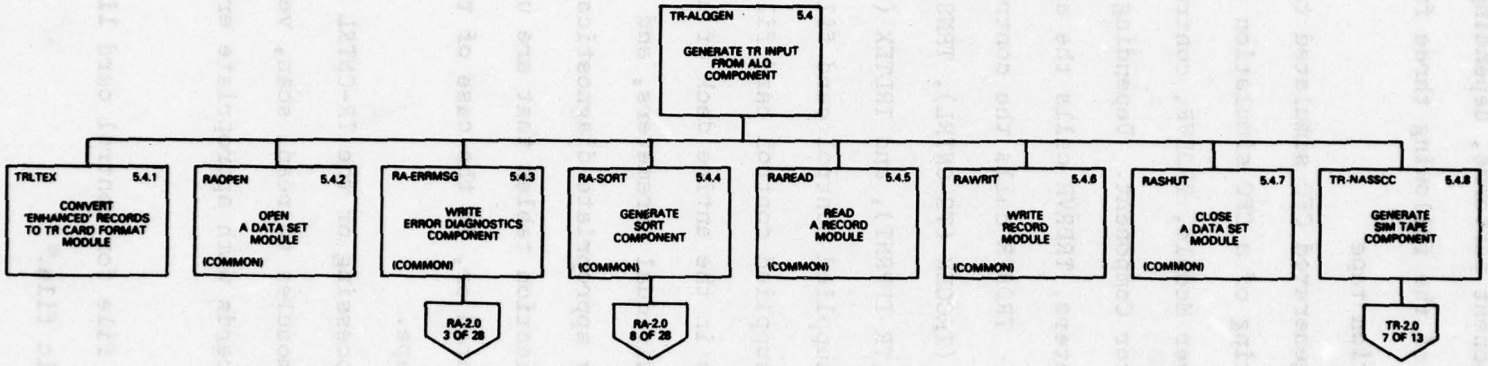


Figure 2.2.2-13. TR-2.0 Visual Table of Contents for the Test Case Generator Component (TR) (13 of 13)

2.2.?.3.2.4 Description Section for the Test Case Generator Component (TR)

2.0 The Test Case Generator Component performs, depending upon user-supplied control cards, one of the following three functions:

- Generates a CFC simulation tape
- Merges two previously generated CFC simulated tapes
- Prints a formatted listing of a CFC simulation tape

3.0 The Test Case Generator Driver Module, TRDRVR, controls processing within the Test Case Generator Component. Depending upon user-supplied control card parameters, TRDRVR calls the appropriate modules to meet the user's requests. TRDRVR calls the control modules of the major processing components (TRCCEX (TR-CNTRL), TRNSEX (TR-NASSCC), TRTMEX (TR-TPMERG), TRTPEX (TR-TPPRNT), and TRLTEX (TR-ALQGEN)).

3.1 RAOPEN opens the user-supplied control card file.

3.2 RASHUT shuts the user-supplied control card file.

4.0 The TR-CNTRL Component reads in the entire deck of user-supplied control cards, verifies the individual parameters, and then prints the control card images with any appropriate diagnostics. It also constructs the message type selection tables that are used to decide which messages the user wants printed or, in the case of the merge function, written to the simulation tape.

4.1 TRCCEX controls the processing of the TR-CNTRL Component. It calls the appropriate modules to read, scan, verify, and print the user-supplied control cards with appropriate error diagnostics, if any.

4.2 RAOPEN opens the print file for control card listing and diagnostics, and the error diagnostic file.

4.3 RAREAD reads a card from the user-supplied control card file.

4.4 RASCAN scans a card image for control information.

4.5 TRVER verifies control information sequence.

4.6 The TR-KYPROC Component processes control card information.

4.6.1 TRKWPR controls keyword processing.

4.6.2 RAVER verifies a keyword value.

4.6.3 The TR-TBUILD Component builds message type selection tables.

4.6.3.1 TRMTST uses time intervals, and message types for each active site and constructs a matrix that is indexed to decide if any given message should be printed or written to the merged simulation tape.

4.6.3.2 RAVER verifies the message type.

4.6.3.3 TRINTC verifies time magnitude.

4.7 The TR-ERPROC Component processes error diagnostics.

4.7.1 TRCCER controls error diagnostic processing.

4.7.2 RAWRIT prints the user-supplied control card image.

4.7.3 The RA-ERRMSG Component prints the error diagnostic message.

4.8 The TR-KWCHEK Component checks a table of mandatory keywords required for the given mode.

4.8.1 TRKWCK controls the keyword table check process.

4.8.2 The RA-ERRMSG Component. (See 4.7.3)

4.9 RAWRIT prints the user-supplied control card images.

5.0 The TR-GENSIM Component consists of the four major processing components of the TR Component:

- TR-NASSCC, which generates a CFC simulation tape
- TR-TPMERG, which merges two previously generated simulation tapes
- TR-TPPRNT, which produces a formatted listing of a simulation tape
- TR-ALQGEN, which enables the user to create a simulation tape tape in order to rerun a scenario which is logged on the ALQ tape

5.1 TR-NASSCC is the component that generates a CFC simulation tape.

5.1.1 TRNSEX is the main driver of the TR-NASSCC Component. It controls all processing during the creation of the CFC simulation tape from card image data.

5.1.2 RAOPEN opens the source input data set, the simulation tape, and possibly the input data list file.

5.1.3 RAREAD reads a source input message.

5.1.4 The TR-HEADER Component creates the header record for the simulation tape and then writes that record to the simulation tape to be generated.

5.1.4.1 TRHDR creates the header record for the simulation tape.

5.1.4.2 RAWRIT writes the header record created to the simulation tape to be generated.

5.1.5 The RA-ERRMSG Component prints a CFC simulation tape creation diagnostic.

5.1.6 The TR-FMTIME Component adjusts and converts the message transmission time.

5.1.6.1 TRFOR adjusts the message transmission time.

5.1.6.2 TRCTIM converts the EBCDIC transmission time to binary seconds.

5.1.7 RAWRIT writes a CFC simulation message.

5.1.8 RASHUT shuts the input source message file, error diagnostic file, simulation tape file, input source message list file, and the print file.

5.1.9 The RA-SORT Component sorts input by time range or message type for printing.

5.1.10 The TR-TPPRNT Component examines each message on the simulation tape and by indexing into the appropriate message type selection table, determines which messages are to be printed. (See 5.3 and subsections of 5.3)

5.2 TR-TPMERG is the component that performs the tape merge process.

5.2.1 TRTMEX is the main driver of the TR-TPMERG Component. It controls all processing during the creation of the merged simulation tape.

5.2.2 RAOPEN opens the two source input files and the merged simulation tape file.

5.2.3 TR-HEADER Component. (See 5.1.4, 5.1.4.1, and 5.1.4.2)

5.2.4 RAREAD reads messages from both input tapes to the merge process.

5.2.5 The TR-SELI Component examines the current input source message and, by indexing into the appropriate message type

selection table, determines if the user wants the input message to be printed.

5.2.5.1 TRSEL examines the transmission time and message type of the current input source message to determine if it should be printed.

5.2.5.2 TRCTIM converts EBCDIC time to binary seconds.

5.2.6 TR-FMTIME Component. (See 5.1.6, 5.1.6.1, and 5.1.6.2)

5.2.7 RA-ERRMSG Component prints a CFC simulation tape merge diagnostic.

5.2.8 RAWRIT writes a CFC simulation message to tape.

5.2.9 RASHUT shuts the two source input files and the merged simulation tape file.

5.2.10 TR-TPPRNT Component. (See 5.3 and subsections of 5.3)

5.3 TR-TPPRNT is the component that will perform the tape print process.

5.3.1 TRTPEX is the main driver of the TR-TPPRNT Component. It will control all processing during the tape print processing.

5.3.2 RAOPEN opens the CFC simulation tape and the report data sets.

5.3.3 RAREAD reads messages from the simulation tape.

5.3.4 TR-SELI Component. (See 5.2.5, 5.2.5.1, and 5.2.5.2)

5.3.5 The RA-SORT Component.

5.3.6 RAWRIT writes messages from the sorted work area to the printer.

5.3.7 RASHUT shuts the simulation tape and report data sets.

5.4 TR-ALQGEN is the component that will generate TR compatible input from the refined ALQ tape.

5.4.1 TRLTEX will create a file of CFC simulation messages in card image format from the filtered ALQ file, which will be sorted by epoch entry time.

5.4.2 RAOPEN opens the sorted filtered ALQ file, the TR card image file, the error diagnostic file, and a print file.

5.4.3 RA-ERRMSG Component prints TR-ALQGEN error diagnostics.

5.4.4 RA-SORT Component will sort records by epoch entry time

5.4.5 RAREAD will read a record from the sorted filtered ALQ file.

5.4.6 RAWRIT will write records to the TR card image file.

5.4.7 RASHUT will shut the TR card image file.

5.4.8 TR-NASSCC Component. (See 5.1 and subsections of 5.1)

2.2.2.3.3 Online Test Director (TA) Component

a. Purpose. The purpose of the Online Test Director (TA) Component is to provide data from simulated input to the OPCX for extensive testing as specified in CPFS Volume III, Offline Support Subsystem Specification.

b. Component Overview. The TA Component is an online program that provides the capability to transmit/receive simulated CFC message traffic. SCC or NAS messages are input from a simulated scenario tape or from a keyboard. Diagnostics, selected messages, or scenario status may be output to a printer or display device.

Initial control of the testing is established from control options input from cards or a keyboard. Simulation options, which serve to specify selected or deleted message types, delta time, listings, CFC message invalidations, and testing termination, are input via a keyboard.

The messages are routed between the CFC Simulation Interface (CSI), the TA Component, and the Executive Subsystem of the OPCX.

An overview of the Online Test Director Component is shown in Figure 2.2.2-14.

c. Functional Description. The Online Test Director Component operates in either a conversational mode or a batch mode. In the conversational mode, user-supplied control information is input via the keyboard. In the batch mode, user-supplied control cards provide the control input. This control input is used to build interface tables, which control the processing functions. Messages are read from a simulation tape generated by the TR Component in the batch mode,

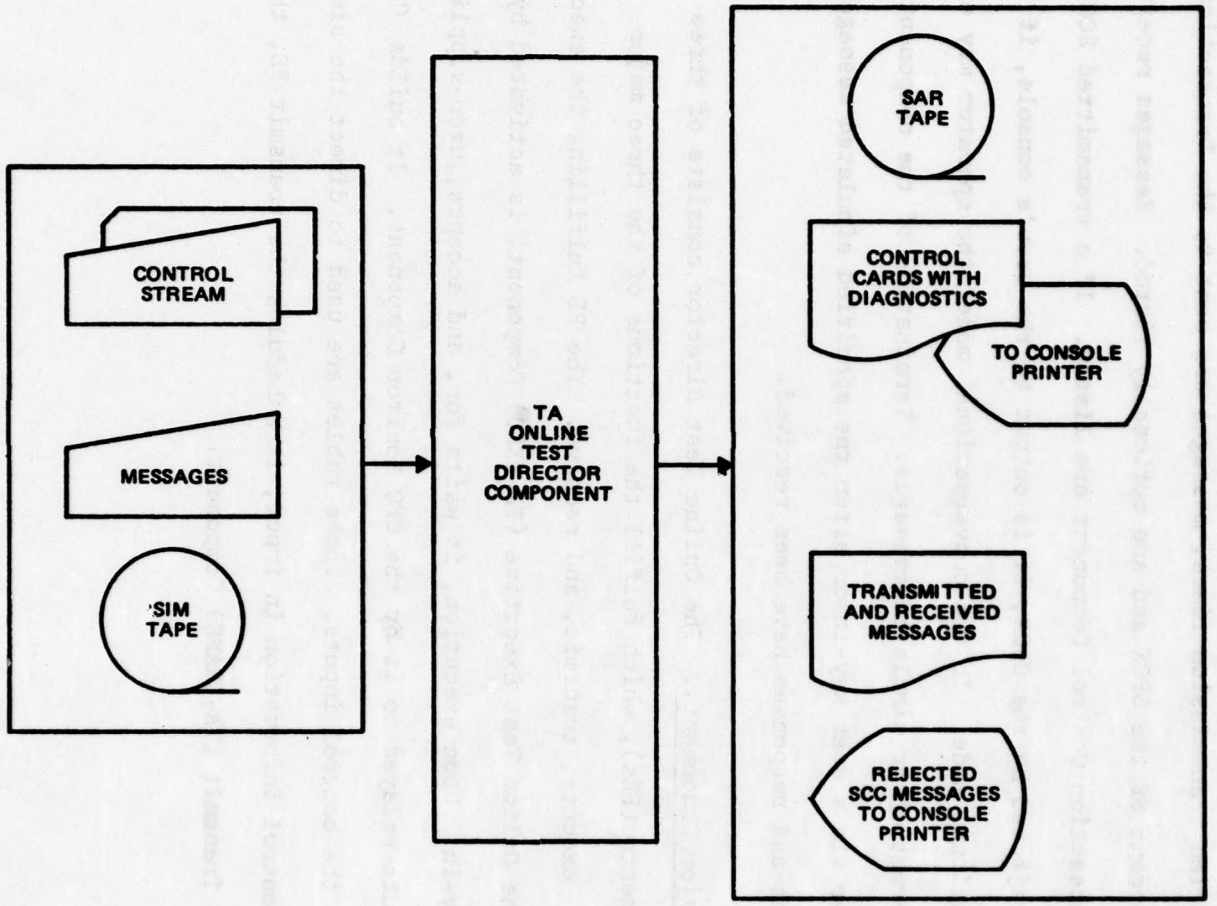


Figure 2.2.2-14. TA-1.0 Online Test Director Component (TA) System Level Overview

or from the simulation tape and keyboard in the conversational mode. Messages to be transmitted may be selected by message type and may be optionally invalidated prior to transmission.

At the specified transmission times, messages are sent to the Transaction Control Component of the OPCX and are optionally listed. Messages received from the Transaction Control Component are listed. If a transmitted SCC message is rejected by the OPCX, it is output to the user's console, if in the conversational mode. In the conversational mode, the operator may either control information or simulated messages. Termination of the component occurs either via a user key-in or after the specified simulated message set has been sent and responses have been received.

d. Major Components. The Online Test Director consists of three Program Elements (PEs), which fulfill the functions of the three major components: execute, transmit, and receive. The PE fulfilling the executive function, the Online Test Executive (TA-EXEC) Component, is activated by an operator key-in. Upon execution, it waits for, and accepts, user-supplied control inputs relayed to it by the CFC Monitor Component. It builds COMPOOL tables from the control inputs. These tables are used to direct the simulation. After all control information in input, it schedules the transmit PE, the Online Test Transmit (TA-TRANS) Component.

The TA-TRANS Component reads messages from the simulation tape, processes them as specified by the control inputs, and sends them to the Transaction Control Component via the CFC Monitor Component at the appropriate message time. The receive PE, Online Test Receive (TA-RECV) Component, is scheduled for execution by the Transaction Control Component of the OPCX when the Transaction Control Component must send a response to the Online Test Director Component. Messages input at the keyboard are relayed via the CFC Monitor Component to the TA-EXEC Component. When the TA-EXEC Component detects that the input is a message, and not control information, it sends it to the Transaction Control Component.

e. Input. There are four classes of inputs to the TA Component: initialization control, simulation options, keyboard-only options, and simulated messages.

Initialization control input specifies the starting environment for testing as identified in Table 2.2.2-1. All initialization control parameters are required for an execution. They may not be respecified once the simulation begins.

Simulation option control input allows the user to specify which message types are to be selected, which messages are to be invalidated and how they are to be changed. Additional simulation options allow the user to speed up the rate of the simulation and selectively turn on or turn off listing of transmitted and received messages. Simulation options control may be input from the keyboard after the simulation has started. These options are described in Table 2.2.2-2.

Table 2.2.2-1. Initialization Control Cards

CONTROL CARD	FIELDS	CONTROL CARD DESCRIPTION
EXECTM	TIME OF DAY	SPECIFIES TIMES OF DAY AT WHICH SIMULATION IS TO BEGIN (IF BLANK, EXECUTION BEGINS IMMEDIATELY)
BGNSIM	START TIME	SPECIFIES THE MESSAGE TIME OF THE FIRST MESSAGE TO BE PROCESSED FROM THE SIMULATION TAPE (IF BLANK, TIME IN ID RECORD IS USED)
SPNSIM	TIME SPAN	SPECIFIES THE TIME SPAN OF THE SIMULATION (IF BLANK, ENTIRE SIMULATION TAPE IS PROCESSED)
MODE	MODE	SPECIFIES BATCH OR CONVERSATIONAL MODE
TAPEID	HEADER ID	SPECIFIES THE SIMULATION TAPE HEADER ID

Table 2.2.2-2. Simulation Options Control Cards

CONTROL CARD	FIELDS	CONTROL CARD DESCRIPTION
SMSG	LIST OF MESSAGE TYPES	ALLOWS TRANSMISSION OF SPECIFIED MESSAGE TYPES (DEFAULT: NO MESSAGE TYPES)
DMSG	LIST OF MESSAGE TYPES	INHIBITS TRANSMISSION OF SPECIFIED MESSAGE TYPES
GARBLE	TRANSMISSION TIME, MESSAGE	SPECIFIES MESSAGE GARBLING INFORMATION BY TRANSMISSION TIME, AND NEW MESSAGE TEXT
MSGIN	ON/OFF SWITCH	LIST RECEIVED MESSAGES ON PRINTER FOR SPECIFIED SIMULATION TIME SPAN
MSGOUT	ON/OFF SWITCH	LIST TRANSMITTED MESSAGES ON PRINTER FOR SPECIFIED SIMULATION TIME SPAN
DSPIN	ON/OFF SWITCH	DISPLAY RECEIVED MESSAGES ON USER'S CONSOLE (DEFAULT OFF)
DSPOUT	ON/OFF SWITCH	DISPLAY TRANSMITTED MESSAGE ON USER'S CONSOLE (DEFAULT OFF)
RATE	SPEED UP FACTOR	ALLOWS A SIMULATION PERIOD TO COMPLETE IN A FRACTION OF THE SIMULATED TIME SPAN

Keyboard-only control input allows the user to enter messages to request status or to terminate the test. Keyboard-only options are described in Table 2.2.2-3. When the Online Test Director Component executes, it proceeds to accept initialization and option control input from cards or keyboard via the CFC monitor until it detects a TACT card. After the END card is read, the simulation begins immediately, or at simulation start time. Changes to simulation options may then be made via keyboard input.

f. Output. Output from the Online Test Director Component consists of a control card listing with diagnostics (if appropriate) and listings of selected input and output messages. Transmitted and received messages will be logged on the Archive Log Queue Tape by the Transaction Control Component (TCC).

g. Interfaces. The TA Component accepts its control cards, keyboard inputs, and simulated messages through the facilities of the Executive Subsystem. Outputs to the Archive Log Queue Tape and to the printer/display device will be through the facilities of the Executive Subsystem. The primary interface for all simulation input will be through the CSI that logically follows the first-level interface handler of the Executive Subsystem. The secondary interface of the TA Component is as a Program Element operating under control of the TCC.

2.2.2.3.3.1 Major Components

The Online Test Director Component consists of three major components: the Online Test Executive (TA-EXEC), the Online Test Transmit (TA-TRANS), and the Online Test Receive (TA-RECV) Components.

Table 2.2.2-3. Keyboard-Only Control Cards

CONTROL CARD	FIELDS	CONTROL CARD DESCRIPTION
TAST		TERMINATES THE TA COMPONENT
TAMG	TEXT	KEYBOARD INPUT MESSAGE
TASR		REQUEST FROM TEST CONTROLLER FOR CURRENT SCENARIO STATE

2.2.2.3.3.1.1 TA-EXEC Component

a. Purpose. The purpose of the Online Test Executive Component is to accept user-supplied control information and pass this information to the other components in a usable form.

b. Functional Description. The functions to be performed by the Online Test Executive Component are to accept, verify, and list user-supplied control cards; output diagnostics for invalid control cards; direct and control processing of subcomponents; open the simulation tape file; accept keyboard inputs; perform component termination; and periodically inform the user of the progress of the simulation.

The Online Test Executive Component accepts user-supplied control information via the CFC Monitor Component from either the keyboard or cards. This control input is listed and verified. Diagnostics are output for invalid control cards. Invalid control cards cause batch runs to be terminated. Valid control information is used to build interface tables that control the processing flow. After a valid set of control information has been input (a TACT card signals the end of the control input), the TA-TRANS Component is scheduled for execution to start the simulation. After the simulation has started, keyboard control input is processed in the above manner. If a message is input, it is formatted and sent to the CSI, and appropriate keyboard message statistics are updated. Component termination occurs if the user inputs a TAST card from the keyboard.

Statistics on the number of messages that were transmitted and the number of accepts and rejects received are optionally displayed on the user's console.

c. Input. Input to the TA-EXEC Component consists of the control cards described in Table 2.2.2-1.

d. Output. Output from the TA-EXEC Component is a set of interface tables containing control information for the TA-TRANS and TA-RECV Components. Operator-supplied simulation messages may also be output.

2.2.2.3.3.1.2 TA-TRANS Component

a. Purpose. The purpose of the TA-TRANS Component is to send simulated messages to the OPCX.

b. Functional Description. The functions to be performed by the TA-TRANS Component are to read messages from the simulation tape; select messages for transmission by message time and type; optionally invalidate messages prior to transmission; send messages to the Transaction Control Component of the OPCX at the appropriate time; and optionally list the messages.

The TA-TRANS Component reads a message from the simulation tape and checks the message type against the interface tables to determine if the message is to be selected for transmission. If the message is to be transmitted, the invalid message generation table is checked, and the message is garbled if so specified. At the appropriate transmission time, messages are sent to the Transaction Control Component of the OPCX and optionally printed.

c. Input. Input to the TA-TRANS Component consists of interface tables built by the TA-EXEC Component and messages from the simulation tape.

d. Output. The TA-TRANS Component sends simulated messages to the Transaction Control Component of OPCX and prints selected transmitted messages. Tape transmission message statistics are also updated.

2.2.2.3.3.1.3 TA-RECV Component

a. Purpose. The purpose of the TA-RECV Component is to receive messages from the OPCX.

b. Functional Description. The functions to be performed by the TA-RECV Component are to receive messages from the Transaction Control Component of the OPCX and list them.

The TA-RECV Component accepts messages from its input queue and, depending on the type of message received, updates the appropriate statistics. Input messages are listed as specified in the interface tables. If the input message is a report, it may be optionally printed but not listed on the user's console.

c. Input. Input to the TA-RECV Component consists of interface tables built by the TA-EXEC Component and messages received from the Transaction Control Component of the OPCX.

d. Output. The TA-RECV Component prints selected received messages and outputs received message statistics.

The Visual Table of Contents for the TA Component is shown in Figure 2.2.2-15.

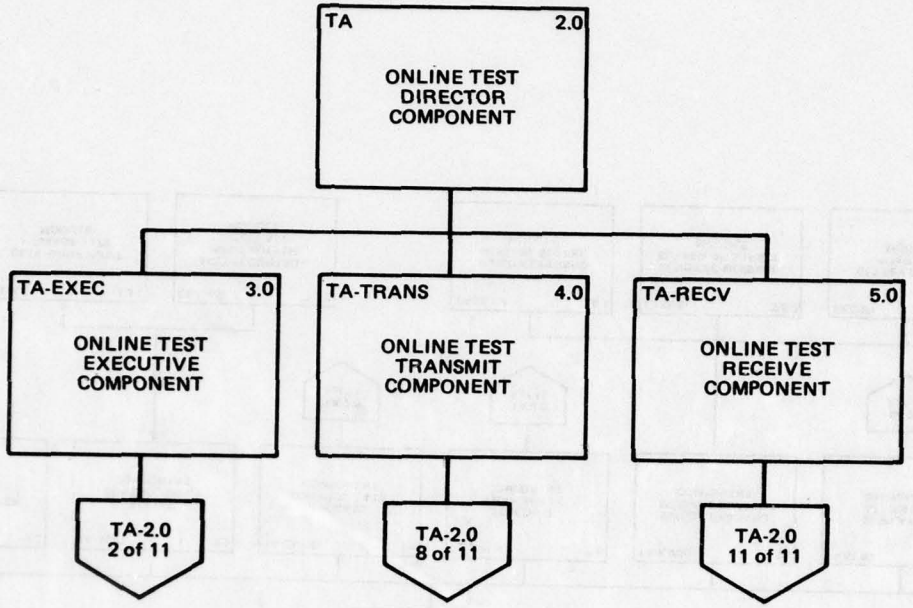


Figure 2.2.2-15. TA-1.0 Visual Table of Contents for the Online Test Director Component (TA) (1 of 11)

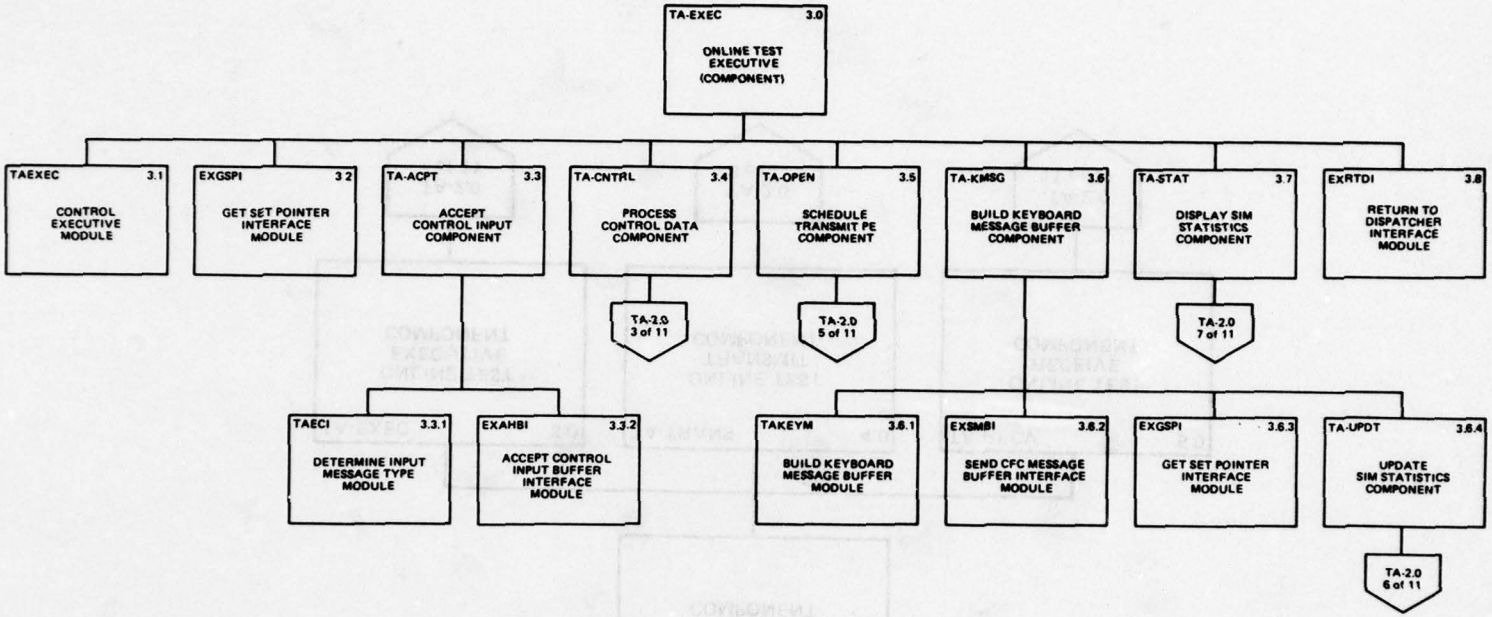


Figure 2.2.2-15. TA-1.0 Visual Table of Contents for the Online Test Director Component (TA) (2 of 11)

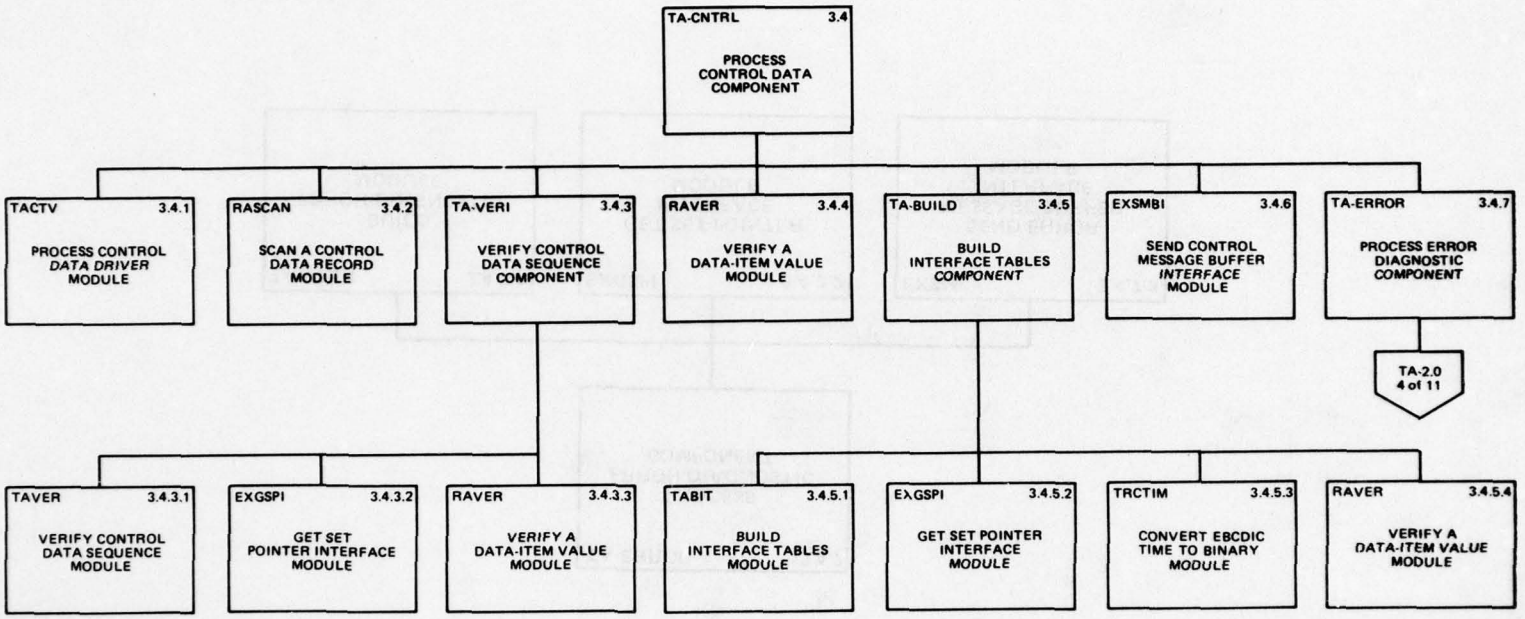


Figure 2.2.2-15. TA-1.0 Visual Table of Contents for the Online Test Director Component (TA) (3 of 11)

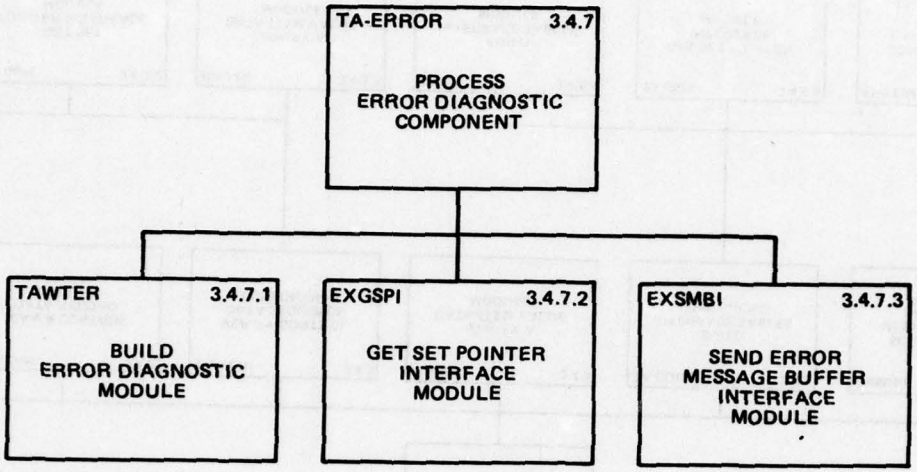


Figure 2.2.2-15. TA-1.0 Visual Table of Contents for the Online Test Director Component (TA) (4 of 11)

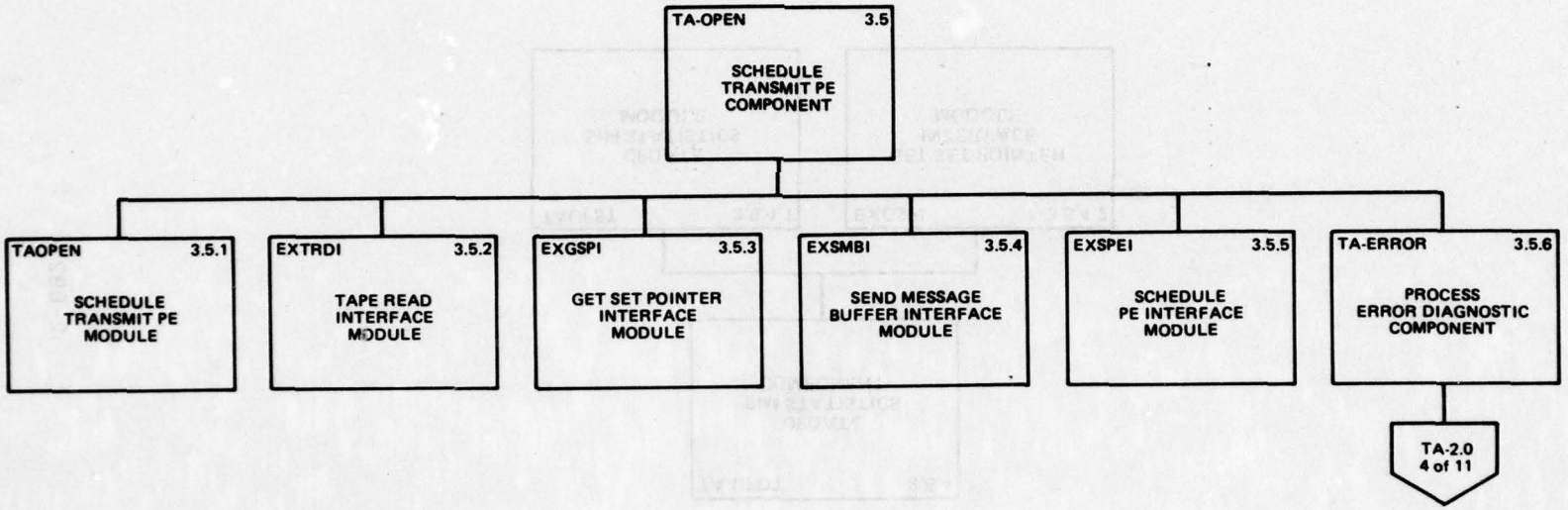


Figure 2.2.2-15. TA-1.0 Visual Table of Contents for the Online Test Director Component (TA) (5 of 11)

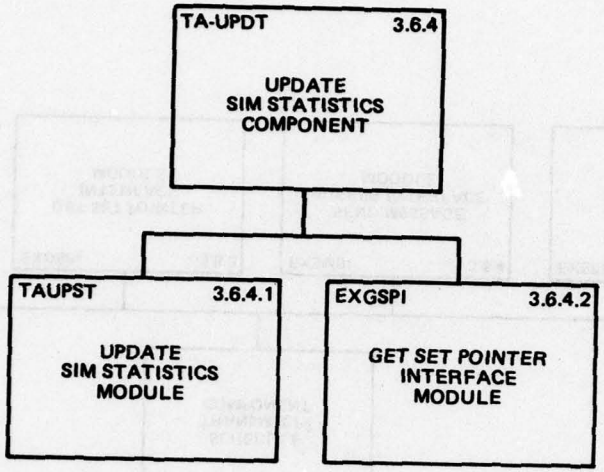


Figure 2.2.2-15. TA-1.0 Visual Table of Contents for the Online Test Director Component (TA) (6 of 11)

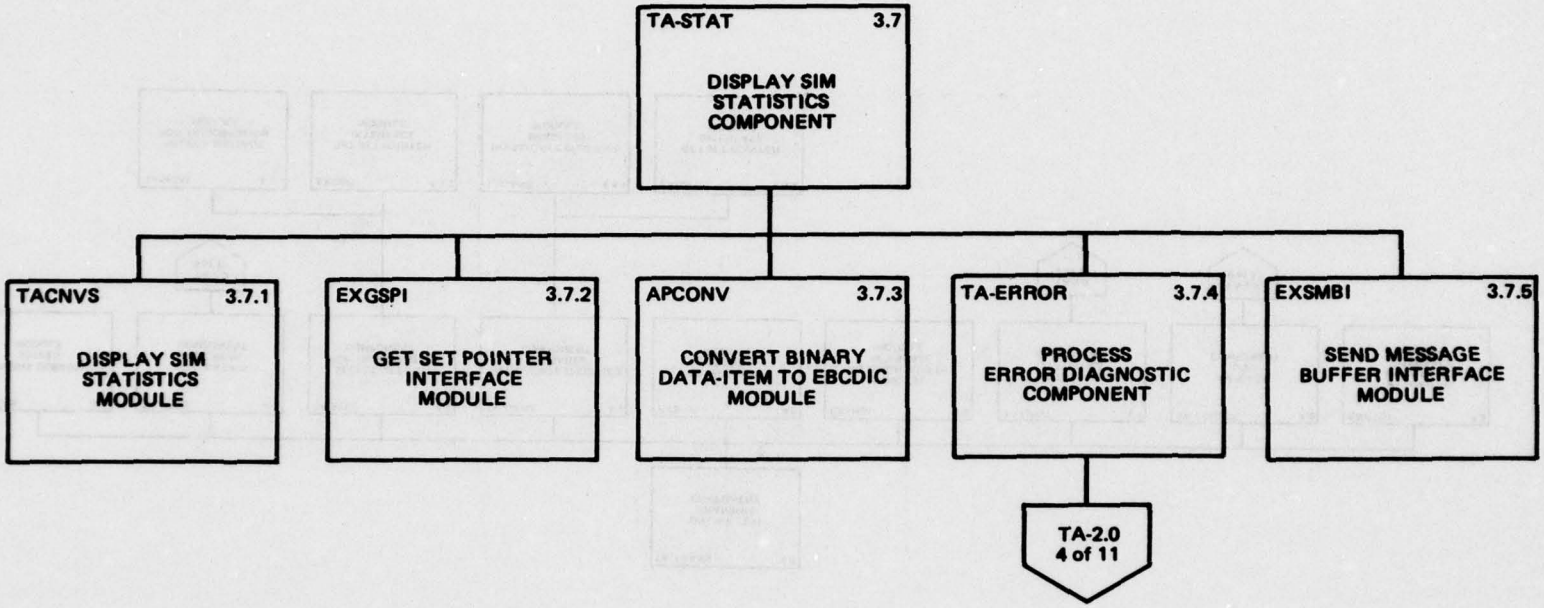


Figure 2.2.2-15. TA-1.0 Visual Table of Contents for the Online Test Director Component (TA) (7 of 11)

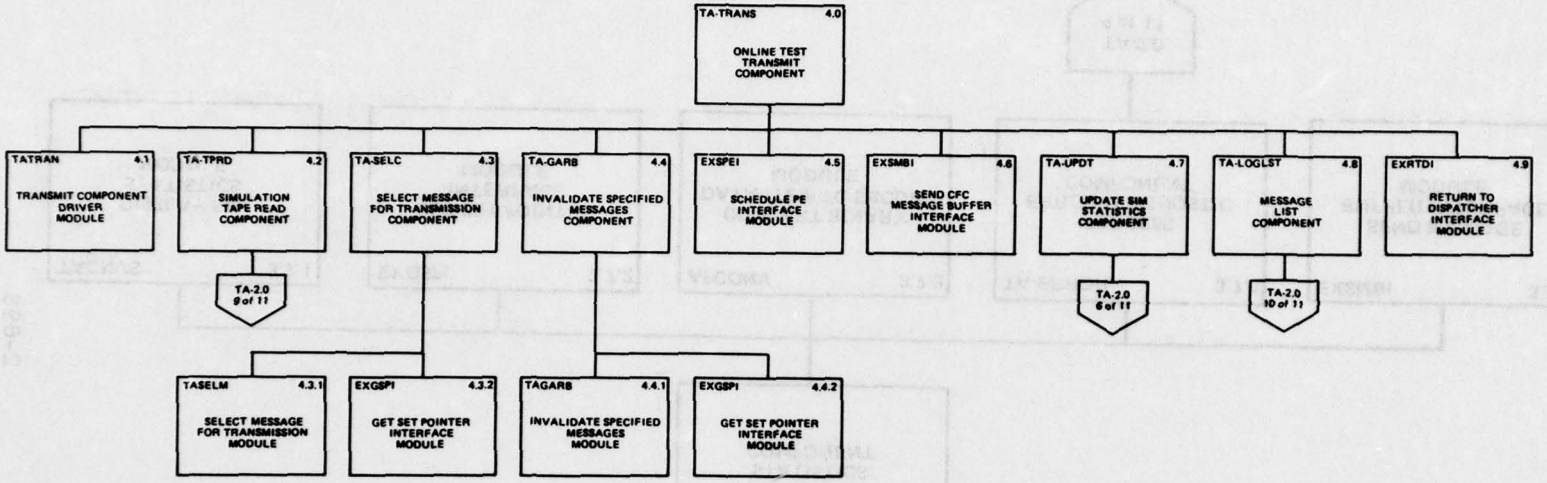


Figure 2.2.2-15. TA-1.0 Visual Table of Contents for the Online Test Director Component (TA) (8 of 11)

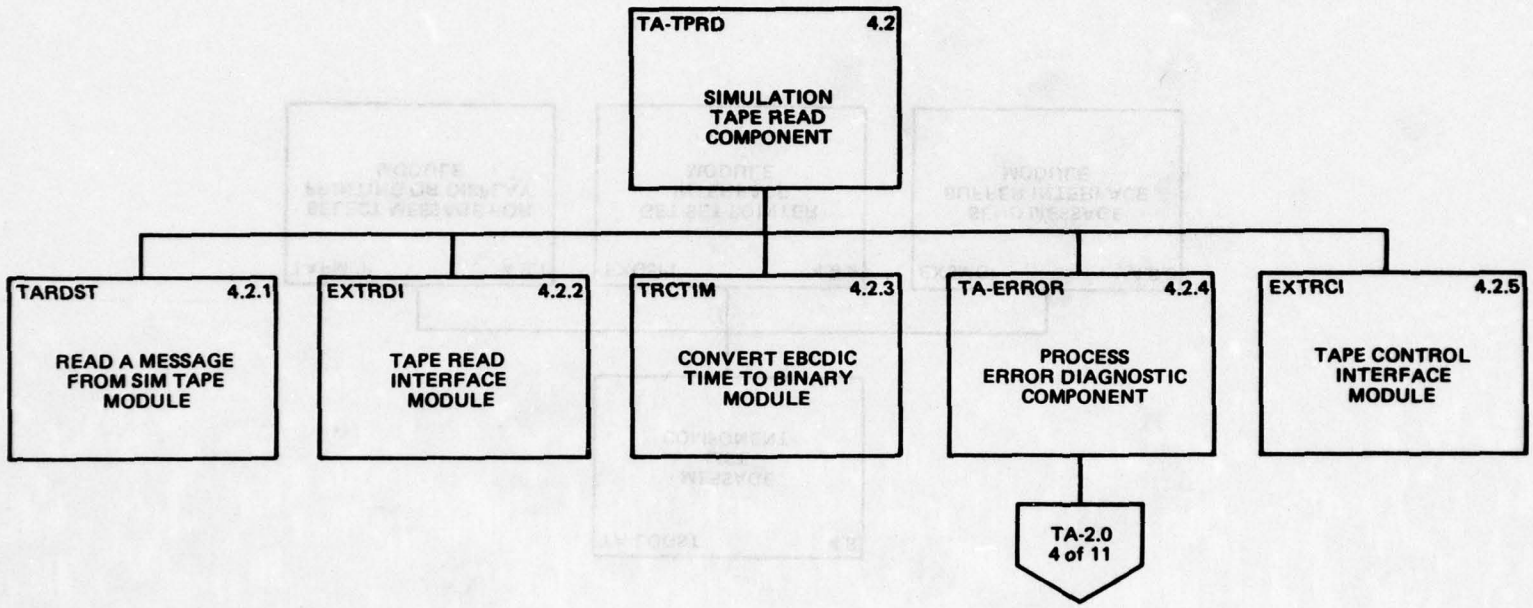


Figure 2.2.2-15. TA-1.0 Visual Table of Contents for the Online Test Director Component (TA) (9 of 11)

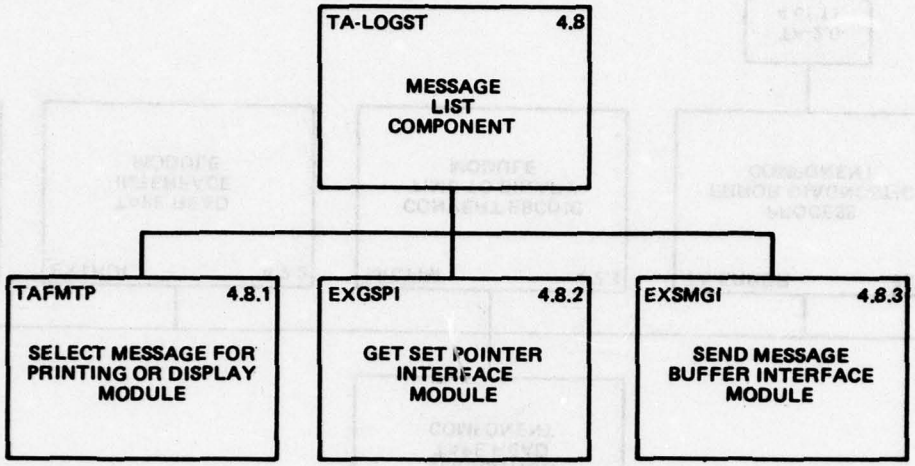


Figure 2.2.2-15. TA-1.0 Visual Table of Contents for the Online Test Director Component (TA) (10 of 11)

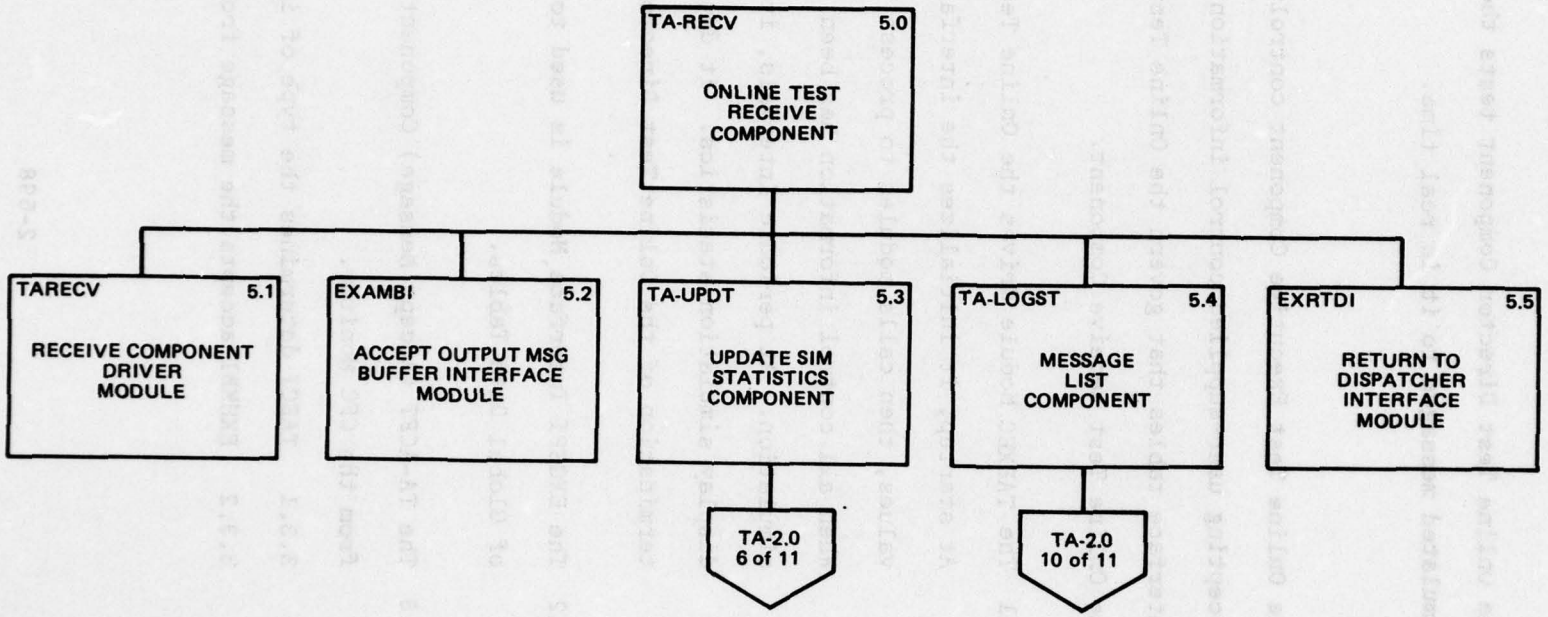


Figure 2.2.2-15. TA-1.0 Visual Table of Contents for the Online Test Director Component (TA) (11 of 11)

2.2.2.3.3.2 Description Section for the Online Test Director Component (TA)

2.0 The Online Test Director Component tests the OPCX by transmitting simulated messages to it in real time.

3.0 The Online Test Executive Component controls the simulation by accepting user-supplied control information and generating the interface tables that govern the Online Test Transmit Component and the Online Test Receive Component.

3.1 The TAEXEC Module drives the Online Test Executive Component. At startup, it initializes the interface tables to default values, then calls modules to process user control input. When all control information has been input, it initiates the simulation. At periodic intervals, it calls a module to display simulation statistics. It detects and performs termination of the Online Test Director.

3.2 The EXGSPI Interface Module is used to obtain the addresses of Global Data Tables.

3.3 The TA-ACPT (Accept Message) Component accepts an input buffer from the CFC Monitor.

3.3.1 TAECI determines the type of input message.

3.3.2 EXHMBI accepts the message from the Monitor.

3.4 The Process Control Card Component generates the interface tables that control the Online Test Director from parameters contained on the control cards.

3.4.1 The TACTV Module prints the control card and determines whether the control card type is valid.

3.4.2 The RASCAN Module is a utility that determines the type and location of fields on the control card.

3.4.3 The TA-VERI Component verifies control data sequence.

3.4.3.1 TAVER controls the verification of control data sequence.

3.4.3.2 The EXGSPI Interface Module is used to obtain the addresses of Global Data Tables.

3.4.3.3 RAVER checks validity of keyword value.

3.4.4 RAVER checks validity of keyword.

3.4.5 The TA-BUILD Component builds control data interface tables.

3.4.5.1 TABIT inserts data into interface tables.

3.4.5.2 The EXGSPI Interface Module is used to obtain the addresses of Global Data Tables.

3.4.5.3 TRCTIM converts EBCDIC numbers to their binary equivalent.

3.4.5.4 RAVER checks validity of keyword value.

3.4.6 The EXSMBI Interface Module is used to send a message to an output device.

3.4.7 The TA-ERROR Component processes control information and tape read errors.

3.4.7.1 TAWTER builds the error diagnostic message buffer.

3.4.7.2 The EXGSPI Interface Module is used to obtain the addresses of Global Data Tables.

3.4.7.3 The EXSMBI Interface Module is used to send a message to an output device.

3.5 The TA-OPEN Component reads the SIM tape header record, checks the tape ID with the user-supplied ID, and sends the header record to the printer. It also schedules the online test transmit component.

3.5.1 TAOPEN controls processing of the tape header record.

3.5.2 The EXTRDI Interface Module uses the read SVC to read a record from the SIM tape.

3.5.3 The EXGSPI Interface Module is used to obtain the addresses of Global Data Tables.

3.5.4 The EXSMBI Interface Module is used to send a message to an output device.

3.5.5 The EXSPEI Interface Module is used to schedule the Transmit Component.

3.5.6 The TA-ERROR Component processes control information and tape read errors.

3.6 The TA-KMSG Component formats a CFC message entered from the keyboard.

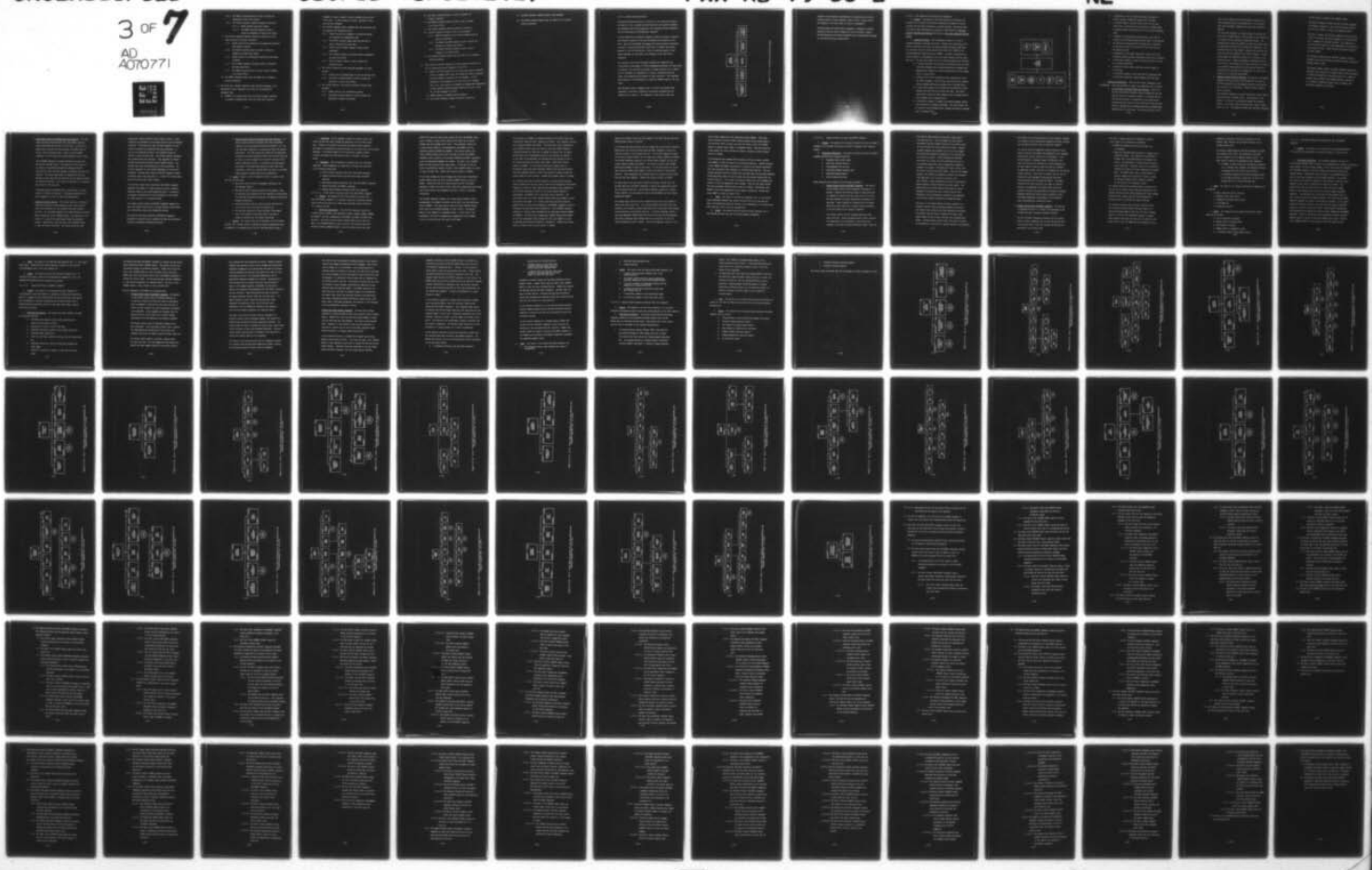
3.6.1 TAKEYM formats a CFC message.

3.6.2 The EXSMBI Interface Module is used to send a message to an output device.

AD-A070 771 COMPUTER SCIENCES CORP SILVER SPRING MD SYSTEM SCIEN--ETC F/G 9/2
CENTRAL FLOW CONTROL. SOFTWARE DESIGN DOCUMENT. VOLUME II. SUPP--ETC(U)
JAN 79 DOT-FA77WA-3955

UNCLASSIFIED CSC/SD-78/6172(2) FAA-RD-79-33-2 NL

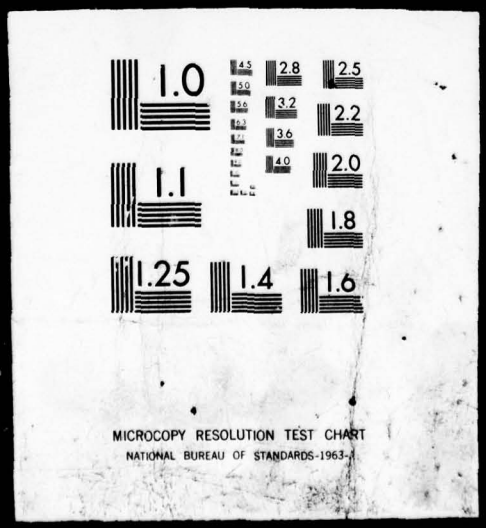
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3.6.3 The EXGSPI Interface Module is used to obtain the addresses of Global Data Tables.

3.6.4 The TA-UPDT Component updates simulation statistics.

3.6.4.1 TAUPST updates statistics tables.

3.6.4.2 The EXGSPI Interface Module is used to obtain the addresses of Global Data Tables.

3.7 The TA-STAT Component displays simulation statistics on the user's console at periodic intervals.

3.7.1 TACNVS controls the conversion of accumulated statistics from binary to EBCDIC.

3.7.2 The EXGSPI Interface Module is used to obtain the addresses of Global Data Tables.

3.7.3 APCONV converts the accumulated statistics from binary to EBCDIC.

3.7.4 The TA-ERROR Component processes control information and tape read errors.

3.7.5 The EXSMBI Interface Module is used to send a message to an output device.

3.8 The EXRTDI Interface Module uses the FINIS SVC to terminate module processing.

4.0 The Online Test Transmit Component sends simulated messages to the Transaction Control Component of the OPCX at the appropriate simulated time.

4.1 TATRAN is the driver module for the Online Transmit Component. It accepts a message buffer from the Online Test Executive

Component or calls a module to read a message from the simulation tape. It calls modules to select, invalidate, send, log, and list messages.

4.2 The TA-TPRD Component reads a message from the simulation tape and computes the transmission time.

4.2.1 TARDST controls the reading of a simulated message and computes the transmission time.

4.2.2 The EXTRDI Interface Module uses the read SVC to read a record from the SIM tape.

4.2.3 TRCTIM converts EBCDIC numbers to their binary equivalent.

4.2.4 The TA-ERROR Component processes control information and tape read errors.

4.2.5 EXTCLI Interface Module is used to rewind the simulation tape.

4.3 The TA-SELC Component selects simulated messages for transmission.

4.3.1 TASELM selects messages based on time and message type.

4.3.2 The EXGSPI Interface Module is used to obtain the addresses of Global Data Tables.

4.4 The TA-GARB Component invalidates specified simulated tape messages.

4.4.1 TAGARB controls the invalidation process.

4.4.2 The EXGSPI Interface Module is used to obtain the addresses of Global Data Tables.

4.5 The EXSPEI Interface Module is used to schedule the Transmit Component.

4.6 The EXSMBI Interface Module is used to send a message to an output device.

4.7 The TA-UPDT Component updates simulation statistics.

4.8 TA-LOGST Component displays and/or lists messages.

4.8.1 TAFMTP determines if the current message should be listed or displayed.

4.8.2 The EXGSPI Interface Module is used to obtain the addresses of Global Data Tables.

4.8.3 The EXSMBI Interface Module is used to send a message to an output device.

4.9 The EXRTDI Interface Module uses the FINIS SVC to terminate module processing.

5.0 The Online Test Receive Component receives message responses sent by the Transaction Control Component of the OPCX.

5.1 TARECV, the driver module for the Online Test Receive Component, accepts a message buffer from the Transaction Control Component and calls modules to log and list the message. It then determines if the response is a reject for an SVC message and, if so, calls modules to display the message with diagnostics. It then updates received message statistics and sets a flag for the last message to be sent.

5.2 EXHMBI accepts the message from the Monitor.

5.3 The TA-UPDT Component updates simulation statistics.

5.4 TA-LOGST Component displays and/or lists messages.

5.5 The EXRTDI Interface Module uses the FINIS SVC to terminate module processing.

2.2.2.4 System Auditing Subsystem

The System Auditing Subsystem, as depicted in the hierarchial diagram of Figure 2.2.2-16, includes the Data Reduction and Analysis Component, the Automated Code Auditor Component, the Precedence Network Component, and the Maintenance and Certification Component.

The Data Reduction and Analysis Component capability ensures a flexible and automatic analysis of the past performance and operation of the OPCX. Real-time recordings of messages and online resource utilization are used in optimizing data base allocations to enhance the balance between I/O and CPU utilization. Using a controlled series of test cases (messages and data base), the integrity of the OPCX can be evaluated.

The Automated Code Auditor Component provides the capability for cost-effective enforcement of JOVIAL programming standards and conventions. In addition, the statistics pertinent to module structure are of assistance in assessing the complexity of a module, optimizing structure usage, and recognizing the presence of case structures. This component also produces a cross-reference of a module's COMPOOL usage at the item level.

The Precedence Network Component uses a Critical Path Method (CPM) algorithm to calculate a schedule of activities necessary for the completion of a project. The component is then used to track the

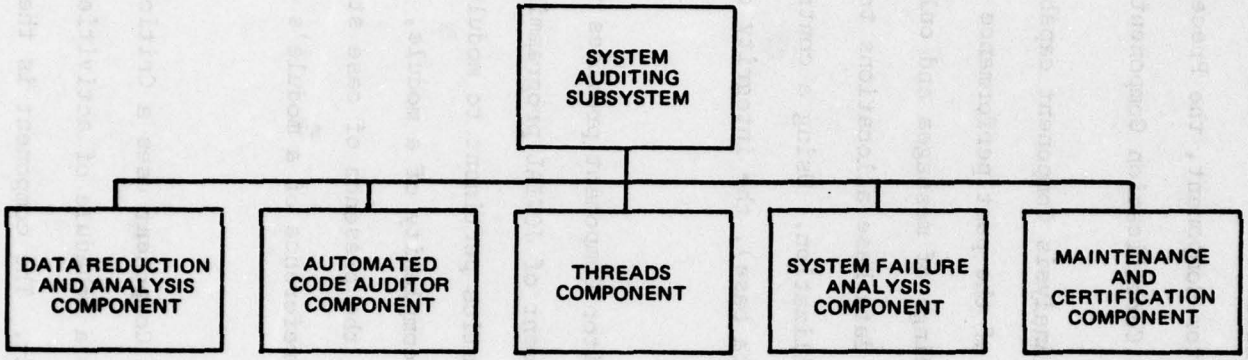


Figure 2.2.2-16. SA Subsystem Hierarchial Diagram

progress of the project by periodically re-evaluating the activity schedule based on actual completion times to date. Output reports are designed to aid and inform all levels of management.

The Maintenance and Certification Component is designed to perform exhaustive offline default diagnosis on any CFC hardware element. The specifications and design information were incorporated as changes to existing NAS-related documentation.

2.2.2.4.1 Data Reduction and Analysis (RA) Component

a. Purpose. The purpose of the Data Reduction and Analysis (RA) Component is to perform the offline processing and analysis of online-recorded and data base information to produce reports, statistical data, and plots of OPCX performance as required in CPFS Volume III, Off-Line Support Subsystem Specification and Volume IV Data Base Subsystem Specification.

b. Component Overview. The RA Component consists of a set of programs designed to process the online recorded sets consisting of the Archive Log Queue (ALQ) Tape, the System Analysis Recording (SAR) Tape, the Data Base Official Airline Guide Flight Record Set (OAGFRS), and the Non-Scheduled Flight Record Set (NSFRS). The mode of operation for the RA Component is determined by the user report requests and the input data sets. The user may request any of the following reports and services:

- A filtered ALQ tape; the data may be filtered by date and time intervals, message source, message destination, message type, message place (airport or center identification in the message text), or record type.
- A general list of the filtered ALQ tape consisting of input and output messages. The list may be sorted by time, message source, message destination, message type or message place.
- A statistical summary of the volume and distribution of input messages selected from the filtered ALQ tape. The output report may be sorted by time, message source, message destination, message type or message place.
- A statistical summary of elapsed time between message receipt and termination of message processing. The output report may be sorted by time, message source, message destination, message type or message place.

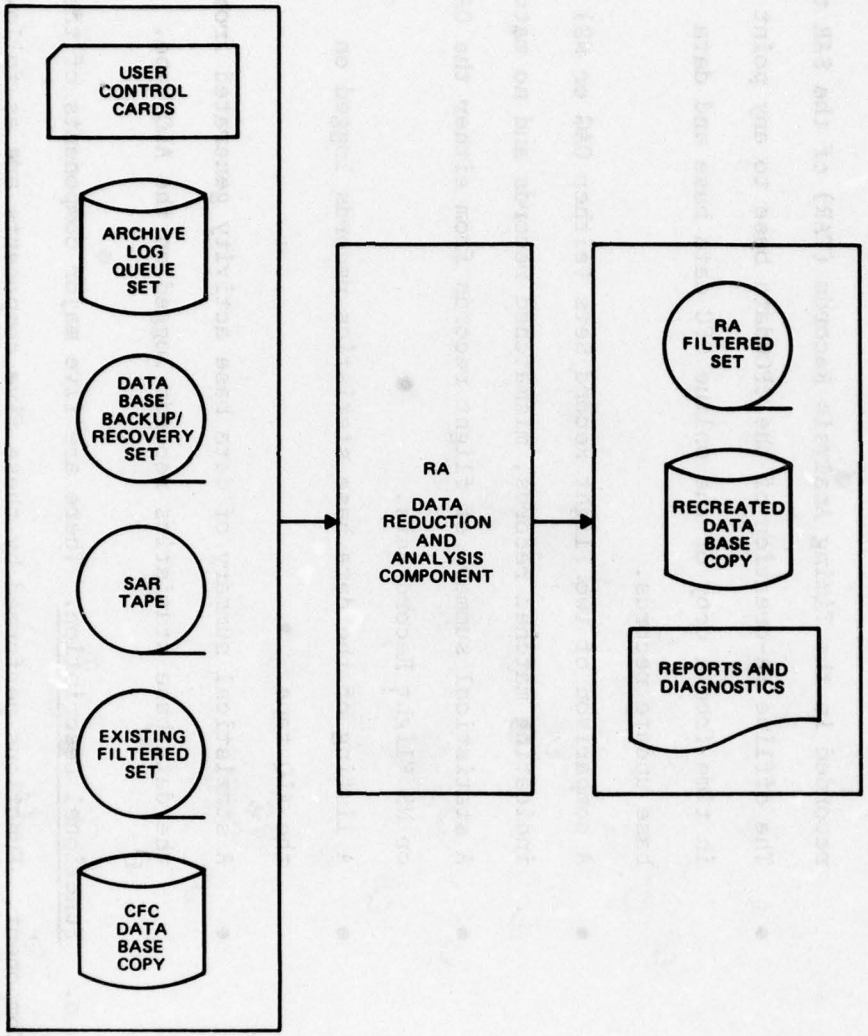


Figure 2.2.2-17. RA-1.0 Data Reduction and Analysis Component (RA) System Level Overview

- A comparison of two ALQ tapes indicating the number of matched records, mismatched records and no matches.
- A formatted dump of selected records from the SAR tape. Records may be selected by time intervals, recording codes or program element identifications (PE IDs) within recording codes.
- A summary of the performance and activity of the OPCX as recorded in the Timing Analysis Records (TAR) of the SAR tape.
- The offline re-creation of the CFC data base to any point in time from a copy of the online CFC data base and data base update records.
- A comparison of two Flight Record Sets (either OAG or NS) indicating matched records, mismatched records and no matches.
- A statistical summary of flight records from either the OAG or NS Flight Record Sets.
- A listing of the data base statistics records logged on the ALQ tape.
- A statistical summary of data base activity generated from the data base statistics records logged on the ALQ tape.

c. Functional Description. There are five major components of the RA Component. Functions performed by these five components are as follows:

1. Filter Archive Log Queue (ALQ) Data Function. The Filter ALQ Data (RA-FILTER) Component selects records from the ALQ tape and writes the selected records to a filtered ALQ set. The selection process is determined by user input filter criteria which may include record selection by data and time interval, message source, message destination, message type, message place or record type. The filtered ALQ set is the

input to the Analyze ALQ Data (RA-ALQRPT) Component from which requested reports are generated and to the Analyze Data Base (RA-DBARPT) Component for data base statistics reports.

The RA-FILTER Component is entered through the Filter ALQ Data Driver (RAFLTR) Module. The function of this module is to control the flow through the remaining modules. The program control cards are parsed; all input and output files are identified and the filter criteria are determined. All necessary files are then opened. Records are read from the input ALQ tape and compared to the filter criteria. If the record passes all specified criteria, it is written to the filtered ALQ set. Normal processing is terminated when an end-of-data is encountered on the input ALQ tape or a record is encountered which exceeds the time interval selection. Processing will terminate with diagnostics if control card errors or I/O errors are encountered.

2. Analyze Filtered ALQ Data Function. The ALQ Data (RA-ALQRPT) Component receives as input the filtered ALQ set from the RA-FILTER Component and user-supplied control cards specifying the report to be generated. Multiple report requests may be specified.

The RA-ALQRPT Component is entered through the Control Report Generation Driver (RACNRL) Module. The function of this module is to control the processing through the remaining modules. The control cards are parsed and a report control table is built. The Analyze Filtered Data (RA-CAFD) Component

is then called to generate the requested report.

The RA-CAFD Component invokes the Sort (RA-SORT) Component if sorting is requested. One of the three report components is then invoked to produce the requested report.

The List or Compare ALQ (RA-CLLC) Component either produces a list of the input and output messages on the filtered ALQ set or compares two filtered ALQ sets. The comparison of the two ALQ sets results in the identification of mismatched and no-match records. These records are printed along with an error summary.

The Calculate Response Times (RA-CELT) Component produces frequency count and probability statistics arrays of selected message response times.

The Generate Summary Reports (RA-CSUM) Component formats the frequency count arrays into a summary report and/or histogram; to format the probability statistics array into a report of minimum, mean, maximum, and standard deviation statistics, or to format a combination report with a histogram and associated probability statistics.

3. Dump System Analysis Recording (SAR) Data Function. The Dump System Analysis Recording (SAR) Data (RA-SARDMP) Component selectively dumps SAR records to a print set. Records to be dumped may be selected by time interval, recording codes or PE IDs within recording codes. Input to the RA-SARDMP Component is the SAR tape set and user-supplied control cards.

The RA-SARDMP Component is entered through the Process SAR Data Driver (RASARD) Module. The function of this module is to control the processing through the remaining modules. Input control cards are first parsed to determine the selection criteria. The report page header is formatted and written. Records are then read from the SAR tape set and compared against the selection criteria. If a record is selected it is formatted and written to the print set.

Processing normally terminates when an end-of-data is encountered on the input SAR tape set. Processing terminates with error diagnostics if any I/O errors are encountered.

4. Analyze Data Base Function. The Analyze Data Base (RA-DBARPT) Component processes the user-supplied control cards and the input files necessary for the requested data base analysis function. The RA-DBARPT Component is entered through the Control Report Generation Driver (RACNRL) Module. The function of this module is to control the processing through the remaining modules. RACNRL first calls the Open a File (RAOPEN) Module to open the control card file. The control cards are then

parsed and a report executive control table is built. These functions are performed in the Process Control Cards (RA-RDCARD) Component. The Process Data Base (RA-DBA) Component is then entered to perform the requested data base processing. At the end of processing the Shut a File (RASHUT) Module is called to close all open files. The RA-DBA Component performs the requested data base function. This component is entered through the Data Base Analysis Driver (RACDBA) Module. The required data base initializations are first performed. One of four components is then entered depending on the function requested. The Data Base Start-Up (DB-STUP) Component creates an offline copy of the data base from a copy of the online data base and the data base update records.

The Calculate Flight Record Statistics (RA-FRSTAT) Component computes total number of flight records by arrival terminal, departure terminal and arrival/departure pairs. In addition, a histogram is generated providing information on the number of flight records in the physical blocks.

The Compare Flight Records (RA-FRCOMP) Component compares two input OAG Flight Record Sets or two input NON-OAG Flight Record Sets identifying no-match and mismatched records.

The Calculate Data Base Statistics (RA-DBSTAT) Component processes a filtered ALQ set, analyzes the data base statistics records, and generates statistical reports.

5. Analyze System Analysis Recording (SAR) Data Function. The Analyze System Analysis Recording (SAR) Data (RA-SARRPT) Component utilizes government-furnished software, i.e., the TARP and REDUC Components, to analyze and report CFC Monitor performance. The TARP program (see NASP-9127 and NASP-9227) processes the Timing Analysis Records (TAR) from the SAR tape in order to produce summaries and detailed listings of CFC Monitor Component activity. In addition, the TARP program can produce a simulated High Resolution Timer (HRT) tape (described in NASP-9111 and NASP-9211) for input to the REDUC timing analysis program (NASP-9111 and NASP-9211).

d. Inputs. Inputs to the RA Component consist of control cards and the following sets:

- The ALQ Set which contains timetagged recording of the OPCX message traffic.
- The SAR Set which contains records of SVC requests, times of initiation and termination of the transaction load modules, I/O times and utilization statistics, EX Subsystem timing and analysis statistics.
- Existing Filtered Data Set, which contains filtered ALQ data records from a previous RA Component run.
- The Data Base Backup Set, which contains a time-tagged copy of the complete online data base to be used to create an offline copy for further processing.

e. Outputs. The outputs from the RA Component are the filtered ALQ Set, the SAR Dump, and the listings and reports requested by user. In addition, a re-created copy of the CFC Data Base may be output.

f. Interfaces. The RA Component accepts its control cards, tape files, and data set input through the facilities of the OS/9020 Component. Outputs to the printer are spooled through the HASP Component and outputs to tape/disk are spooled through the I/O facilities of the OS/9020 Component. The offline subsets of the operational complex software to access and update the data base are used to recreate data base copies.

g. Components. The RA Component is divided into five functional components. These components are identified as follows and described in the following subsections.

- Filter Archive Log Queue (ALQ) Data (RA-FILTER Component)
- Analyze Filtered Archive Log Queue (ALQ) Data (RA-LQRPT) Component
- Dump System Analysis Recording (SAR) Data (RA-SARDMP) Component
- Analyze Data Base (RA-DBARPT) Component
- Analyze System Analysis Recording (SAR) Data Component

2.2.2.4.1.1 Filter Archive Log Queue (ALQ) Data (RA-FILTER) Component

a. Purpose. The purpose of the Filter Archive Log Queue (ALQ) Data (RA-FILTER) Component is to provide a data set of selected records from an Archive Log Queue Set, based upon filtering criteria specified in a control card set.

b. Functional Description. The RA-FILTER Component consists of a driver module (RAFLTR), four additional modules (RAOPEN, RASHUT, RAREAD, and RAWRIT), and four subcomponents (RA-QPARSE, RA-PARSE, RA-INPUT, and RA-FREC). The Filter ALQ Data Driver (RAFLTR) Module first calls the Open a File (RAOPEN) Module to open a control card file and then calls the Read a Record (RAREAD) Module to read the control cards into core.

RAFLTR then calls the Quick Parse Control Card Set (RA-QPARSE) Component to conduct a quick scan in search of DD names for the error message and error message print files. This component consists of a driver module (RAEFIL), one subcomponent (RA-SCANER), and two additional modules (RAOPEN and RASHUT). The Process Control List Driver (RAEFIL) Module first calls the Scan a Record (RA-SCANER) Component, which consists of two modules (RASCAN and RAVER), repeatedly until the appropriate DDNAMES are located. The Open a File (RAOPEN) Module is then called to open these files. If only one of the two files is successfully opened, the Shut a File (RASHUT) Module is called to close the open file. RAEFIL then returns control to RAFLTR.

If the error message and error message print files were successfully opened, RAFLTR calls the Write a Record (RAWRIT) Module to write a header. RAFLTR then calls the Parse Control Card Set (RA-PARSE) Component to parse the control cards, verify the completeness and correctness of the control card commands, and build a table of filtering information.

The RA-PARSE Component consists of a driver module (RAFPAR), three subcomponents (RA-SCANER, RA-OCLIST, and RA-FLDV), and one additional module (RAVERN). The Parse Control Card Set Driver (RAFPAR) Module first calls the RA-SCANER Component to scan a field. The scanned field is then compared to acceptable values. If the value is not acceptable, the field is flagged and an appropriate error message is set to be written with the control card image.

If the field is a DDNAME or filtering identifier the Build Field Value Verification Table (RA-FLDV) Component is called. This component consists of two modules (RAFLDV and RAVER). The Build Field Value Verification Table (RAFLDV) Module calls the Verify a Data Item (RAVER) Module to determine whether the identifier or DDNAME is entered into the appropriate table, and corresponding selectors and counters are updated. If the value is unacceptable, the appropriate error message is set to be written following the control card image. RAFLDV then returns control to RAFPAR. If the control card data is numeric and all associated fields have been processed, RAFPAR calls the Verify Numeric Data-Item (RAVERN) Module to convert the fields to integer values and verify range and value validity. RAVERN then returns control to RAFPAR.

If a control card error has been detected or an entire card has been parsed, RAFPAR calls the List Control Card Set and Diagnostics (RA-CCLIST) Component to print the card image and any associated error diagnostics. The RA-CCLIST Component consists of the driver module (RALSTC) a subcomponent (RA-ERRMSG) and an additional module (RA-WRIT). The List Control Card Set Driver (RALSTC) Module first calls RAWRIT to write the control card image. If a control card error has been detected, RALSTC calls the Write Error Diagnostics (RA-ERRMSG) Component to direct writing of the associated error diagnostics. The RA-ERRMSG Component consists of a driver module (RAEMSG),and two additional modules (RAREAD and RAWRIT). The Write Error Diagnostics (RAEMSG) Module calls RAREAD to read the appropriate error message and then calls RAWRIT to write the message and associated diagnostic information. RAEMSG then returns control to RALSTC which returns control to RAFPAR.

When all the control cards have been parsed, or an error has been detected, RAFPAR returns control to RAFLTR.

If no errors have been detected and one record type is the filter selection, RAFLTR calls the Filter By Record Type (RA-FREC) Component to write the selected records to the filtered data set. The RA-FREC Component consists of the driver module (RAFREC) and two additional modules (RAREAD and RAWRIT). The RA-FREC Component consists of the driver module (RAFREC) and two additional modules (RAREAD and RAWRIT). The Filter By Record Type (RAFREC) Module calls RAREAD to read an ALQ record. If the record meets the record type criterion, RAFREC calls RAWRIT to write the record to the filtered data set. This processing loop continues until all records from the input data set have been examined. RAFREC then returns control to RAFLTR.

If record type is not the filter selection criterion, RAFLTR calls the Process Input Data (RA-INPUT) Component to select the appropriate records for the filtered data set. The RA-INPUT Component consists of a driver module (RACPIN), two subcomponents (RA-FIL and RA-ERRMSG) and two modules (RAREAD and RAWRIT).

The Process Input Data Sets Driver (RACPIN) Module first calls RAREAD to read an ALQ record into core. If no filter selection criteria have been specified, all formatted records associated with a particular input message will be written to the filtered data set. If filter selection criteria have been specified, RACPIN calls the Filter Input Data (RA-FIL)Component each time an Enhanced Input Message Record is encountered to pass the record through the filter criteria. The RA-FIL Component consists of the

driver module (RACFIL) and one additional module (RAVER). The Filter Data by Selected Criteria (RACFIL) Module selects record fields based on the specified filter criteria and calls the Verify a Data Item (RAVER) Module to compare these fields to acceptable values. When the record has either passed all filter criteria or failed a criterion, RACFIL returns control to RACPIN.

If the Enhanced Input Message Record passes all filter criteria, RACPIN calls RAWRIT to write the record to the filtered data set. RACPIN continues to call RAREAD and RAWRIT successively to write all the records associated with this particular input message to a filtered disk data set. This processing continues until all records from the input data set have been examined. RACPIN maintains totals of input records read and records selected for the filtered data set. If an error is detected, RACPIN calls the RA-ERRMSG Component to write the appropriate error message. When all the input records have been processed, RACPIN returns control to RAFLTR. RAFLTR then calls RAWRIT to write the appropriate filter summary information. RAFLTR then calls RASHUT to close all opened files.

c. Input. The inputs to the ALQ Data Component are: 1) the control cards containing commands that specify the data sets to be used and the type of filtering and selection criteria to be implemented; 2) the Filter ALQ input data set; and 3) the error message file.

d. Output. The outputs from the Filter ALQ Data Component are: 1) the filtered ALQ data set; and 2) printed summary information.

2.2.2.4.1.2 Analyze Filtered ALQ Data (RA-ALQRPT) Component

a. Purpose. The purpose of the Analyze Filtered ALQ Data (RA-ALQRPT) Component is to process the filtered ALQ data to generate user requested reports.

b. Functional Description. The Analyze Filtered ALQ Data (RA-ALQRPT) Component performs the following functions:

- Processes Control Card Inputs
- Sorts the Filtered Data Set
- Lists/Compares the ALQ Tape
- Calculates Message Response Times
- Generates Summary Reports
- Lists Filtered Data Sets.

These functions are provided by the following components.

1. Process Control Cards (RA-RDCARD) Component. The purpose of the Process Control Cards (RA-RDCARD) Component is to provide a flexible and efficient means of specifying sets of commands to identify the input data sets and to select the data analysis and report generation processing to be performed. These commands are formatted into the Report Executive Control Table Set to direct further processing of the Data Reduction and Analysis Component.

   The Process Control Card Set Component performs three major functions: reads and parses control cards, verifies the completeness and correctness of the control card commands, and builds the Report Executive Control Table Set.

The Control cards required to process a single report are read into core. All card images are then scanned and parsed, and each command entered in the control cards is then verified for valid keywords and values. Missing required commands and commands in error will be flagged and appropriate diagnostic messages will be printed when the cards are printed. Invalid keywords and improper card format will cause the card containing the error to be displayed immediately, and an appropriate diagnostic message to be issued. Processing will then continue with the control cards for the next report. Based on the command requests, the COMPOOL is searched to extract the necessary item descriptors for the filter, selection, and sort criteria. These extractions are used to populate the Report Executive Control Table Set for this report. The Report Executive Control Table Set describes the report parameters including the title, filter criteria, sort parameters, and the probability statistics and frequency-count vectors needed to generate the requested report.

The input to the Process Control Card Set Component is a stream of control cards containing commands that specify the required data analysis and report generation processes. The control cards are used to describe the report type, report label, filter criteria, and sort and histogram parameters. Multiple report control card sets may be included in one execution to provide for various reports to be generated.

The output of the Process Control Card Set Component consists of a control card and associated diagnostics printer listing, and the Report Executive Control Table Set (RARECT).

The Control Card and diagnostic listing consists of each report's control card images and appropriate error messages. Each control card is listed as it is processed. If an invalid keyword or improper format is detected in any card, the card will be followed by an error message, and the next report's control cards will then be displayed. No additional control cards will be displayed for the invalid control card set. Each report's control card set will be followed by error messages indicating any additional errors detected while building the RARECT. The RARECT identifies the input data sets, the types of analysis reports to be generated, the report type, filter and selection criteria item descriptors and values, histogram parameter definitions report option, parameter values, sort/merge parameters, and pointers to the frequency count, and probability statistics vectors.

2. Analyze Filtered Data (RA-CAFD) Component. The function of component RA-CAFD is to control the processing of the filtered ALQ tape to generate requested reports.

The Sort (RA-SORT) Component processes the sort control table to build a parameter list for the IBM utility sort. It then calls SORT to sort the filtered ALQ data set as specified in the control table.

The List or Compare ALQ RA-CLLC Component is capable of two types of I/O message set processing.

- Reads the filtered ALQ Data Set and lists the I/O messages.
- Reads two filtered/sorted data sets to compare all or requested records. The comparison is performed on message type, source/destination, and message text fields. Any mismatched or no-match errors generate print indicators. Frequency counts are calculated to summarize the number of errors categorized by message type. The RARECT report type is then modified to indicate summary mode operation in order to invoke the Generate Summary Reports Component (RACSUM) for the output of the frequency counts.

All records selected for printing either by selection for the log list or because print indicators generated by the compare process have the common message date (date, message recording time, message type and source/destination) formatted prior to printing the complete message.

The Calculate Response Times (RA-CELT) Component reads the filtered and sorted archive log queue data set to calculate message response times for the time of message receipt to the time the termination message is logged. These elapsed-time values are then used to update the frequency count vector for summaries and histograms and the

probability statistics vector for calculation of the minimum, mean, maximum, and standard deviations of the message elapsed time.

The Generate Summary Reports (RA-CSUM) Component processes the frequency count vector and probability statistics vector to generate the I/O message summary reports. Two basic types of reports are generated by this component.

- A summary of event totals with probability statistics (i.e., minimum, mean, maximum, and standard deviation of message rates for a given time interval).
- A combination probability statistic-histogram report on one page describing a single type of event (i.e., message rate for a selected message type).

c. Input. The inputs to the analyze filtered data components are as follows:

- Report executive control table set
- Frequency count array report
- Probability statistics array report
- I/O Message Set
- Transaction Time Set.

d. Output. The outputs from the analyze filtered data components are as follows:

- List of selected I/O messages
- Summary report of message types
- Log comparison listings
- Summary report of comparison errors
- I/O message response times summary report.

2.2.2.4.1.3 Dump System Analysis Recording (SAR) Data (RA-SARDMP) Component

a. Purpose. The purpose of the Dump SAR Data Component(RA-SARDMP) is to provide a formatted dump of selected records of a SAR data file.

b. Functional Description. The RA-SARDMP Component consists of a driver module (RASARD) which includes five subcomponents and modules to open data sets (RAOPEN), to write records (RAWRIT), and to close data sets (RASHUT). The RA-SARDMP Component is entered through the Process SAR Data Driver (RASARD) Module. RASARD first calls the Open a File (RAOPEN) Module to open all data sets required by the RA-SARDMP Component. The process SAR control cards (RA-CNTL) Component is then called to parse the user-supplied control cards to determine the selection criteria. The header record from the input SAR file is then read and the report header is then formatted and written by the Print Headers (RA-SHDR) Component. A processing loop is then entered with repeated calls to read, filter and print the accepted records. The Filter Data (RA-GARB) Component compares the record to the selection criteria. If the record passes the selection criteria, the Format and Print Records (RA-FDMP) Component is called to write the record. Where required, appropriate error diagnostics are written by the Write Error Diagnostics (RA-ERRMSG) Component. After all records have been processed, the Write a Record (RAWRIT) Module is called to write the summary print lines. The Shut a File (RASHUT) Module is then called to close all open data sets.

c. Input. The inputs to the Dump SAR Data Component are: 1) the control cards which specify the SAR record selection criteria, 2) the SAR file to be processed, and 3) the error message file.

d. Output. The outputs from the Dump SAR Data Component are: 1) listing of the control cards with the appropriate diagnostics, and 2) the selected SAR records which are formatted and printed.

2.2.2.4.1.4 Analyze Data Base (RA-DBARPT) Component

a. Purpose. The purpose of the Analyze Data Base Component is: to reconstruct a data base offline; to generate a flight record statistics report; to compare two OAG Flight Record Sets and two Non-OAG Flight Record Sets and generate a listing of mismatched and no-match records; and to produce data base statistics reports on data base table usage, response times and lock queues.

b. Functional Description. The Analyze Data Base Component performs the following functions:

- Processes user-supplied control cards specifying the report type and report criteria.
- Reconstructs a copy of the CFC Data Base.
- Generates statistical reports on the flight record sets.
- Compares flight record sets.
- Lists the Data Base statistics records from the filtered ALQ set.
- Generates statistical reports of data base accesses and table usage.
- Generates a statistical summary of data base lock queue usage.

The Analyze Data Base (RA-DBARPT) Component is entered via the Control Report Generation Driver (RACNRL) Module. This module controls the processing through the RA-DBARPT Component. RACNRL first calls the Open a File (RAOPEN) Module to open the SYSIN control card file. RACNRL then calls the Process Control Cards (RA-RDCARD) Component to process the control cards. The Process Data Base (RA-DBA) Component is then called to generate the requested report. The Shut a File (RASHUT) Module is then called to close the SYSIN file.

The two components of RA-DBARPT are discussed below.

1. Process Control Cards (RA-RDCARD) Component. The purpose of the Process Control Cards (RA-RDCARD)Component is to provide a flexible and efficient means of specifying sets of commands to identify the input data sets and to select the data analysis and report generation processing to be performed. These commands are formatted into the Report Executive Control Table Set to direct further processing of the Data Reduction and Analysis Component.

   The Process Control Card Set Component performs three major functions: reads and parses control cards, verifies the completeness and correctness of the control card commands, and builds the Report Executive Control Table Set.

   The Control cards required to process a single report are read into core. All card images are then scanned and parsed, and each command entered in the control cards is

then verified for valid keywords and values. Missing required commands and commands in error will be flagged and appropriate diagnostic messages will be printed when the cards are printed. (Invalid keywords and improper card format will cause the card containing the error to be displayed immediately, and an appropriate diagnostic message to be issued. Processing will then continue with the control cards for the next report.) Based on the command requests, the COMPOOL is searched to extract the necessary item descriptors for the filter, selection, and sort criteria. These extractions are used to populate the Report Executive Control Table Set for this report. The Report Executive Control Table Set describes the report parameters including the title, filter criteria, sort parameters, and the probability statistics and frequency-count vectors needed to generate the requested report.

The input to the Process Control Card Set Component is a stream of control cards containing commands that specify the required data analysis and report generation processes. The control cards are used to describe the report type, report label, filter criteria, and sort and histogram parameters. Multiple report control card sets may be included in one execution to provide for various reports to be generated.

The output of the Process Control Card Set Component consists of a control card and associated diagnostics printer listing, and the Report Executive Control Table Set (RARECT).

The Control Card and diagnostic listing consists of each report's control card images and appropriate error messages. Each control card is listed as it is processed. If an invalid keyword or improper format is detected in any card, the card will be followed by an error message, and the next report's control cards will then be displayed. No additional control cards will be displayed for the invalid control card set. Each report's control card set will be followed by error messages indicating any additional errors detected while building the RARECT. The RARECT identifies the input data sets, the types of analysis reports to be generated, the report type, filter and selection criteria item descriptors and values, histogram parameter definitions report option, parameter values, sort/merge parameters, and pointers to the frequency count and probability statistics vectors.

Process Data Base (RA-DBA) Component. The Data Base (RA-DBA) Component is entered through the Data Base Analysis Driver (RACDBA) Module. RACDBA first calls the data base module DBWAIM to establish the data base work area address. The Start-Up Data Base(DB-STUP) Component is then invoked if the function requested is: construct an offline copy of the CFC Data Base; generate flight record statistics; or compare flight record files.

If the requested function is comparison of flight record files, RACDBA, after calling DB-STUP, then calls the Open a File (RAOPEN) Module to open temporary output sets to contain the OAG and Non-OAG Flight Records. Successive calls are then made to the Get Flight Record (DB-GETR) Component, Get Next Flight Record (DB-GETE)

Component and Write a Record (RAWRIT) Module to retrieve all records from the OAG and Non-OAG Flight Record Sets and write the records to sequential sets. DB-STUP is then invoked a second time to start-up the alternate data base. Flight records are again retrieved and written to sequential data sets. The Compare Flight Records (RA-FRCOMP) Component is then called. RA-FRCOMP first sorts all four sequential sets by departure terminal, aircraft identification, departure time, and arrival terminal. The two sets containing OAG data are then read sequentially and the records are compared. A report of mismatched or no match records is output.

If the function requested is flight record statistics, RACDBA, after calling RA-CREATE, calls the Calculate Flight Record Statistics (RA-FRSTAT) Component. This component reads blocks of records from the OAG Flight Record Set and retrieves,from the standard header on each block, information concerning the arrival terminal, departure terminal, and the number of records in each block. The statistics are accumulated, sorted as required, and the report is generated. The Non-OAG Flight Record Set is then processed in a similar manner and a report is generated.

If the function requested is data base statistics, RACAFD calls the Calculate Data Base Statistics (RA-DBSTAT) Component. RA-DBSTAT will produce one of the following three reports depending on the user input request:

- A formatted listing of the data base statistics

records from the Filtered ALQ Set

- A summary report of data base table accesses including access type, retrieval method and response times
- A summary report of data base lock queue statistics including type of lock and number of locks for each table.

RA-DBSTAT is entered through the Data Base Statistics Driver (RADBST) Module. RADBST first calls the Open a File (RAOPEN) Module to open the input Filtered ALQ Set. RADBST then invokes the Reformat Records (RA-DREF) Component. RA-DREF reads the input Filtered ALQ Set, retrieves the data base statistics records and reformats each physical record into logical records that are then written to a work data set.

If the function requested is to list the data base statistics records, RADBST invokes the List Statistics Records (RA-DFD) Component to read the work data set and format and write the statistics records.

If the function requested is a summary report, RADBST next invokes the Sort (RA-SORT) Component to sort the work set according to the user-specified sort criteria. RADBST then invokes either the Compute Statistics (RA-DSUM) Component or the Compute Lock Statistics (RA-DBLOCK) Component to generate the requested summary report.

a. Input. The inputs to the Analyze Data Base Component are:

- User-supplied control cards defining the report to be generated

- Data Base Recovery/Update Sets
- Filtered ALQ Set.

d. Output. The outputs from the Analyze Data Base Component are:

- A rebuilt and selectively updated copy of the online data base
- The flight record statistics report summarizing arrivals, departures, and arrival/departure pairs
- A list of no-match and mismatched records from the comparison of Flight Record Sets
- A listing of data base statistics records from the filtered ALQ set
- A statistical summary of data base table usage
- A statistical summary of data base table locks.

2.2.2.4.1.5 Analyze System Analysis Recording (SAR) Data Component

a. Purpose. The purpose of the SAR Data Component is to calculate statistics and generate reports based upon timing analysis of the OPCX operation.

b. Functional Description. The Analyze System Analysis Recording Component consists of two Government-furnished modules from the NAS System that are described briefly below. Each module has its own control card set that is described in the supplied documentation.

1. The Timing Analysis Records Program (TARP) (See NASP-9127 and NASP-9227)reads the TARP control card set to select the criteria for this run and the Timing Analysis Recording Set. The program generates a Program Element Activate/De-activate Elapsed Time Report, a Parallel Program Operation

Report, a SVC Summary by Program Element Report, and a Purge Processing History Report. A simulated High Resolution Timer data set is optionally created as input to the next module of this component.

2. The High Resolution Timer Reduction Program (REDUC) (NASP-9111 and NASP-9211) reads the REDUC control card set to select the criteria for this run and the simulated HRT data set,and generates a Compute Element Statistics Report, a Program Element/SVC Statistics Report, an I/O Statistics Report, an External Interrupt Statistics Report, and a Sequential Activity Report.

c. Input. The inputs to the Analyze System Analysis Recording Component are the TARP and REDUC Control Card Sets and the System Analysis Recording Set.

d. Output. The outputs from the Analyze System Analysis Recording Component are as follows:

- Program Element Activate/Deactivate Elapsed Time Report
- Parallel Program Operation Report
- SVC Summary by Program Element Report
- High Resolution Time Data Set (optional)
- Compute Element Statistics Report
- Program Element/SVC Statistics Report
- I/O Statistics Report

- External Interrupt Statistics Report
- Sequential Activity Report.

The Visual Table of Contents for the RA Component is shown in Figure 2.2.2-18.

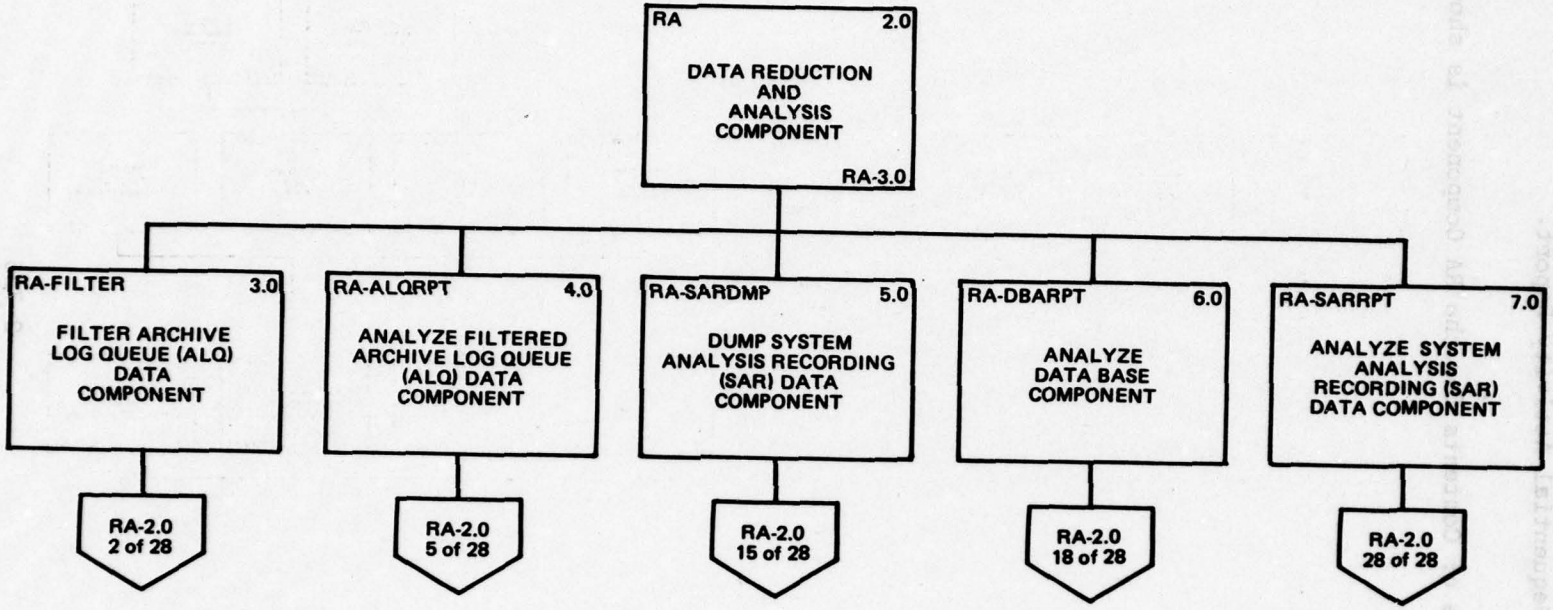


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (1 of 28)

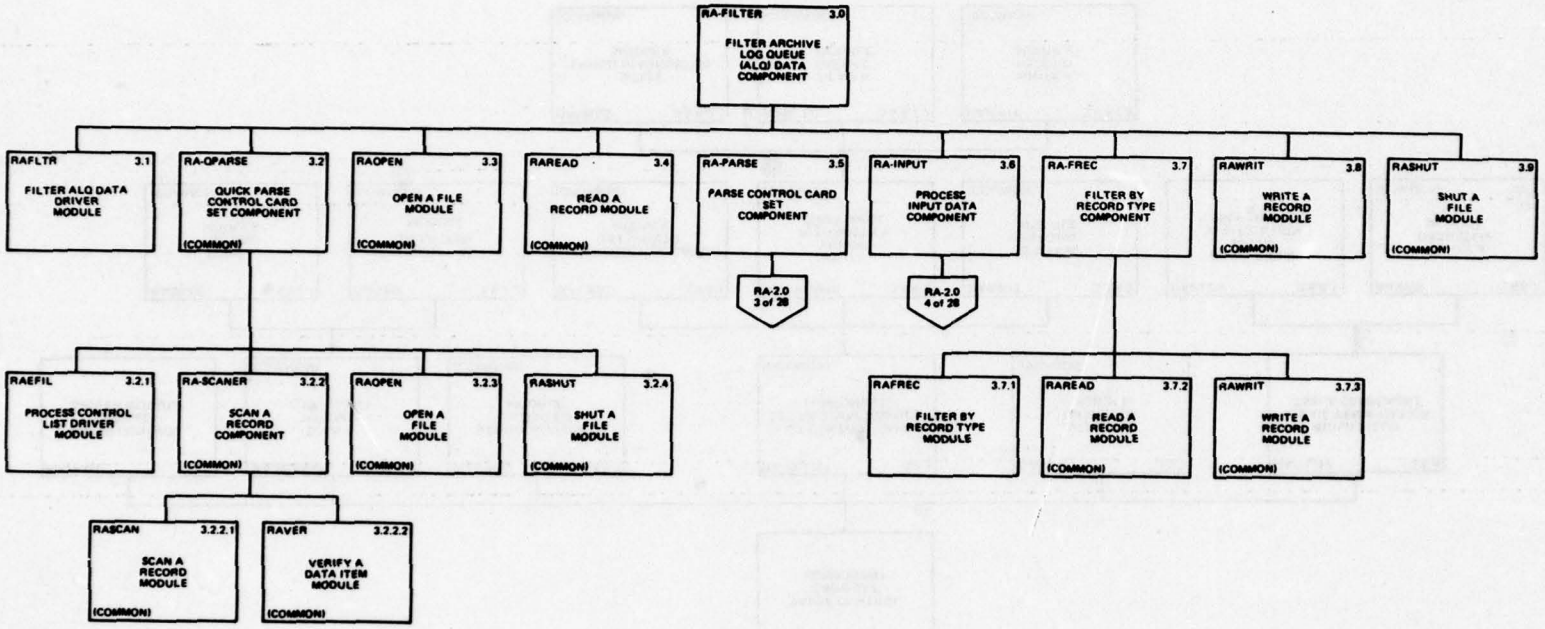


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (2 of 28)

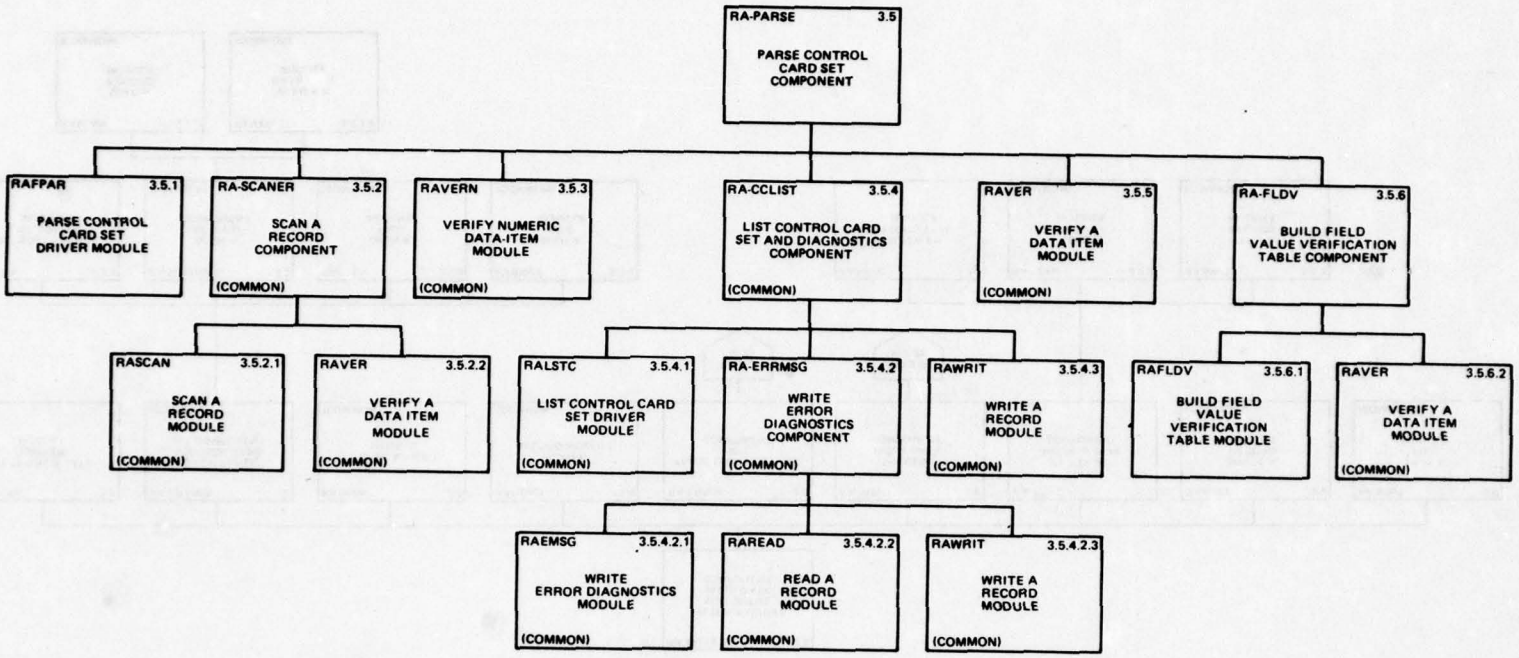


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (3 of 28)

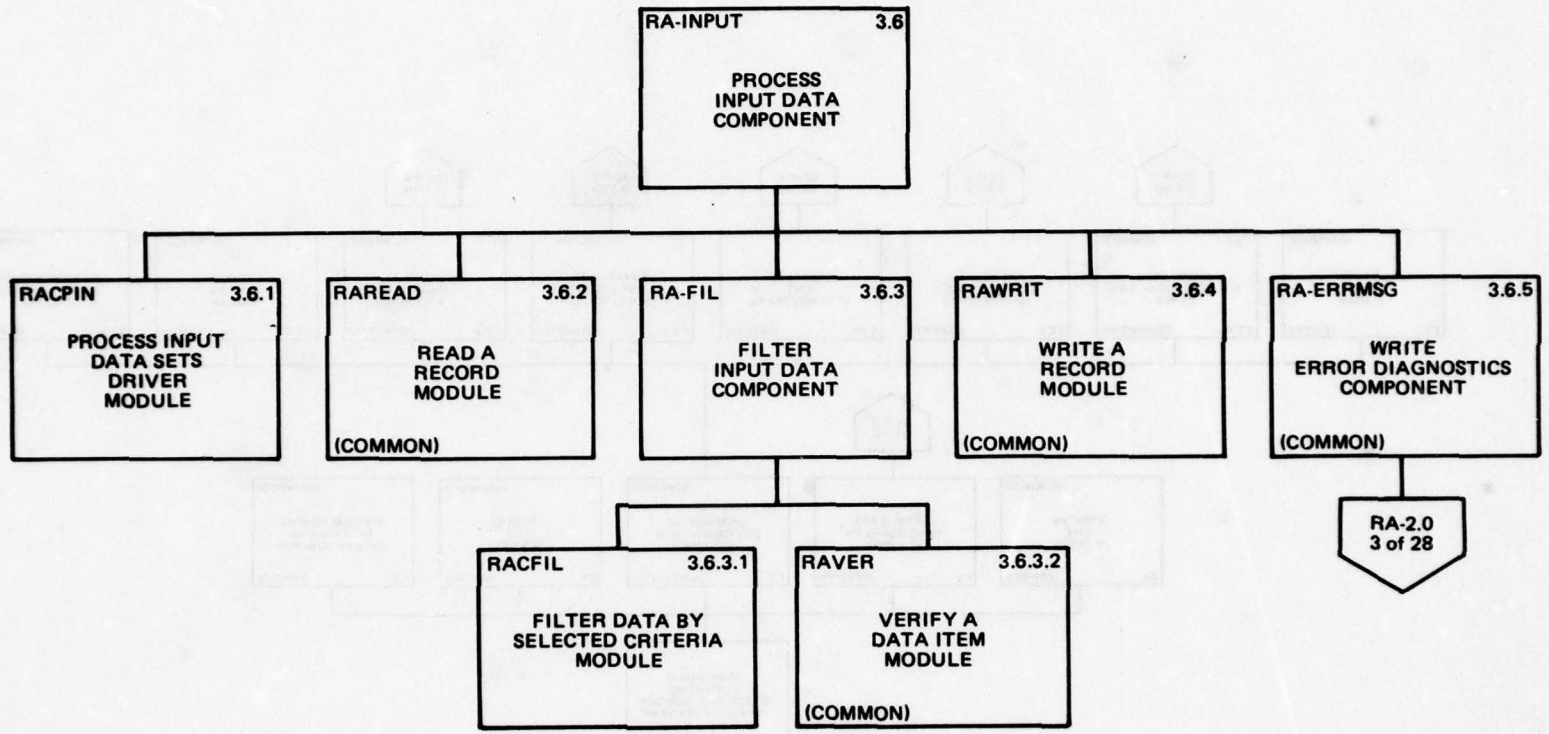


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (4 of 28)

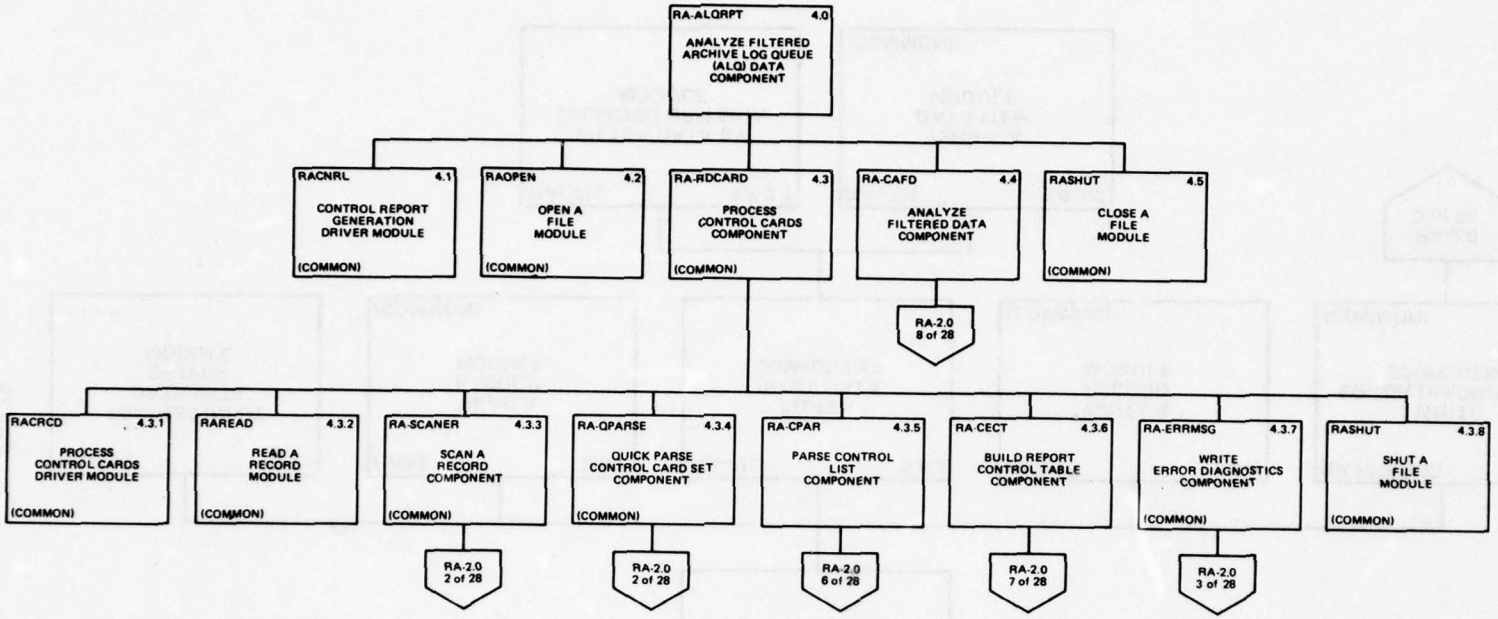


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (5 of 28)

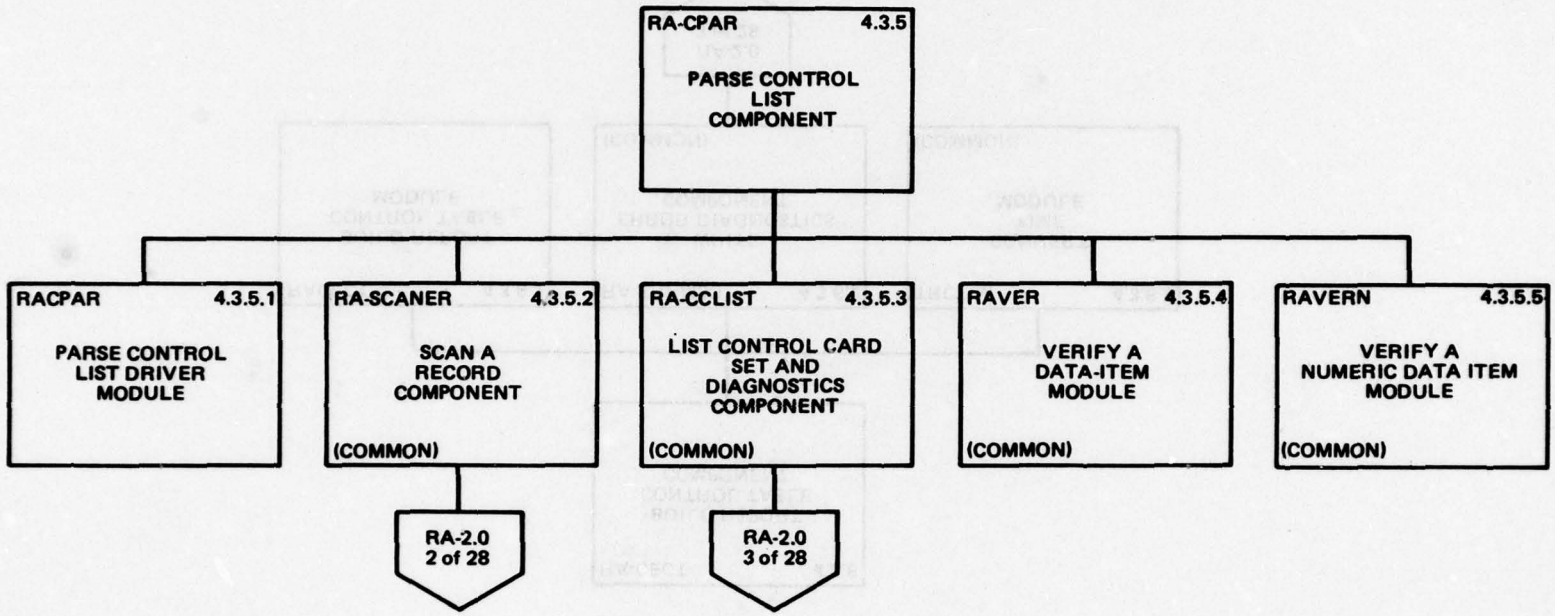


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (6 of 28)

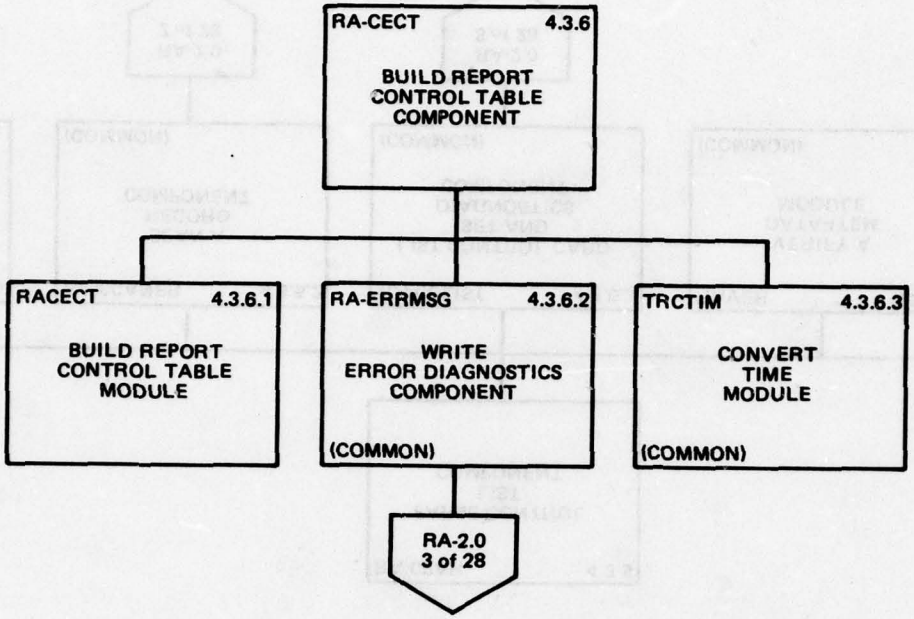


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (7 of 28)

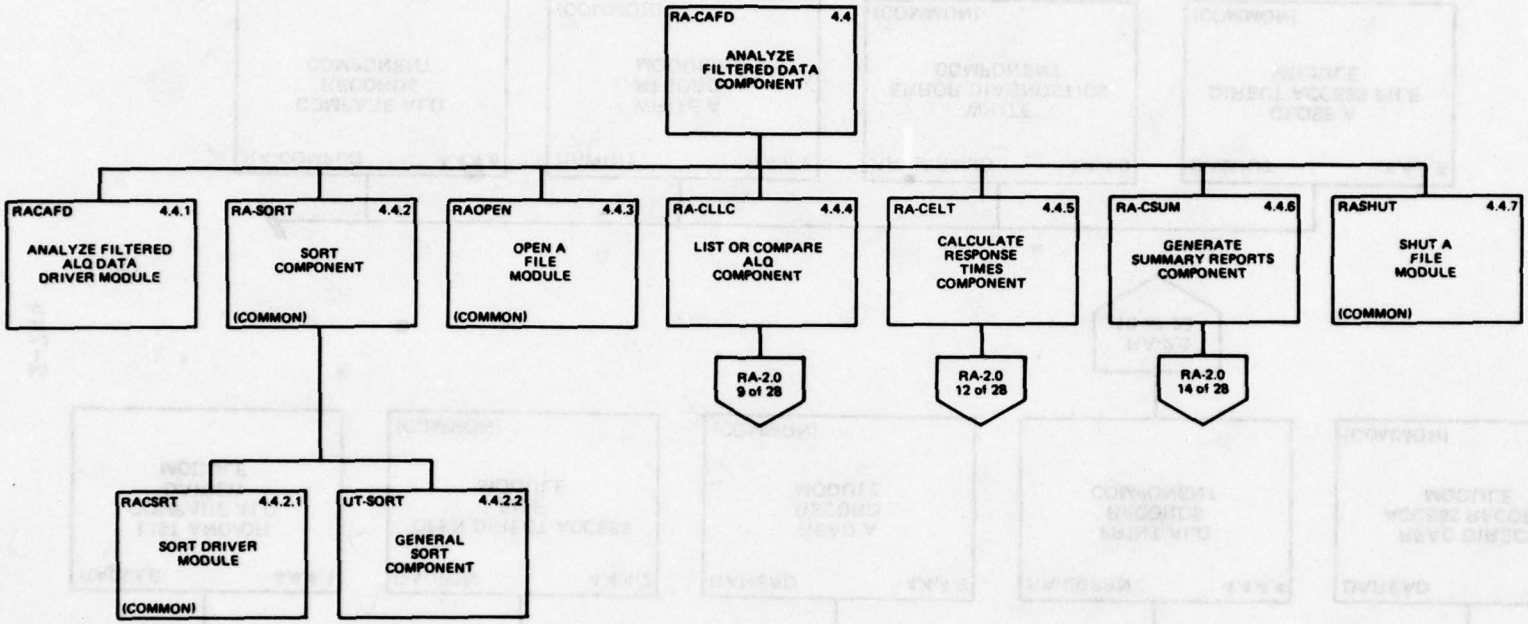


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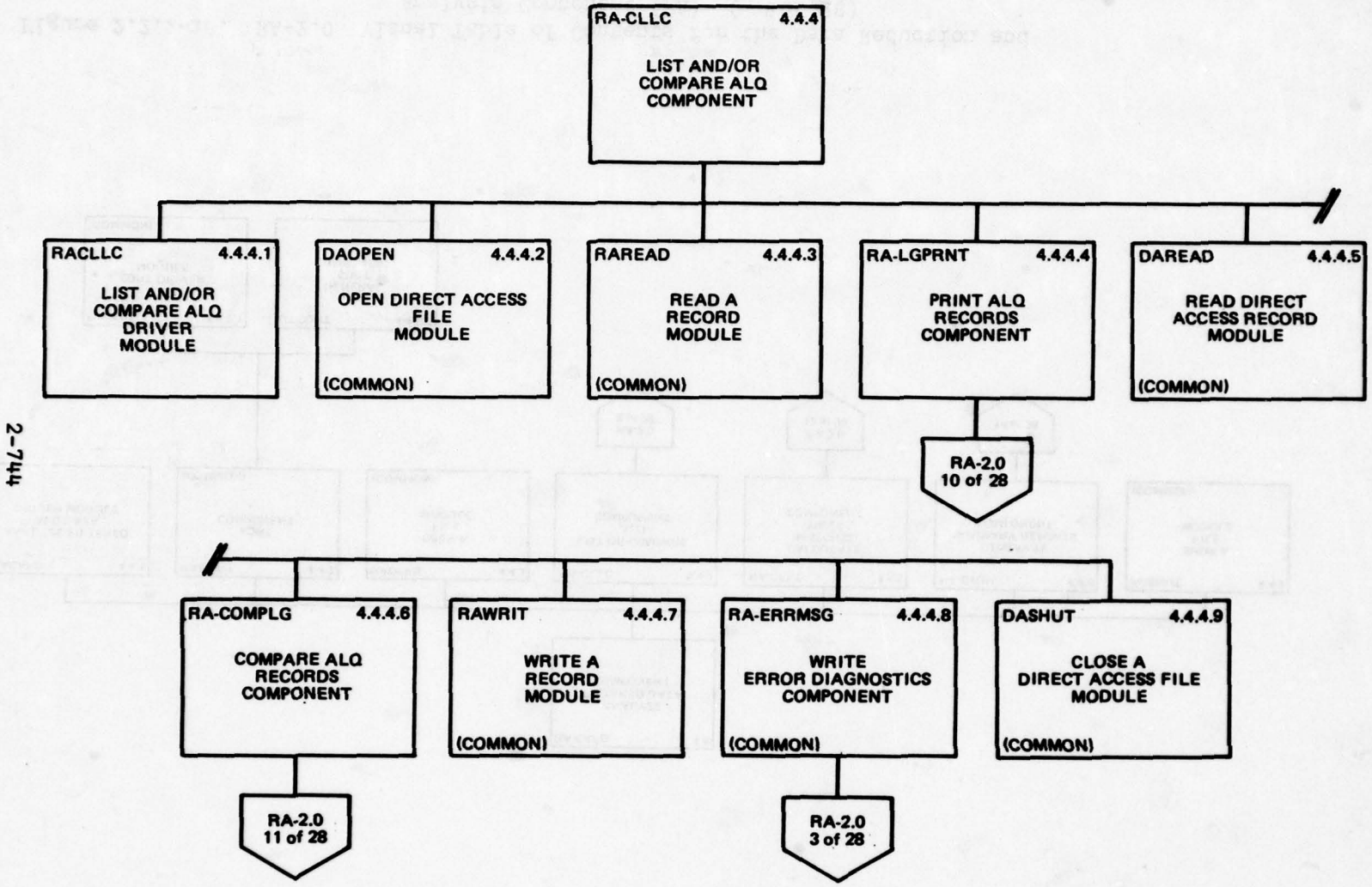


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (9 of 28)

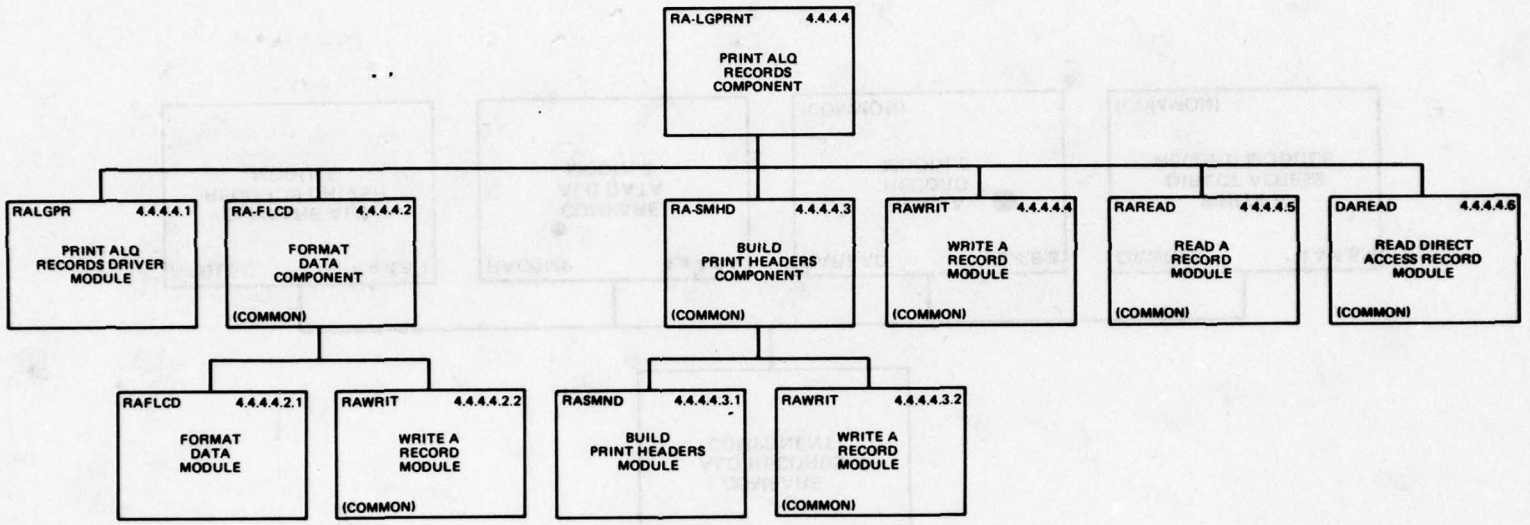


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (10 of 28)

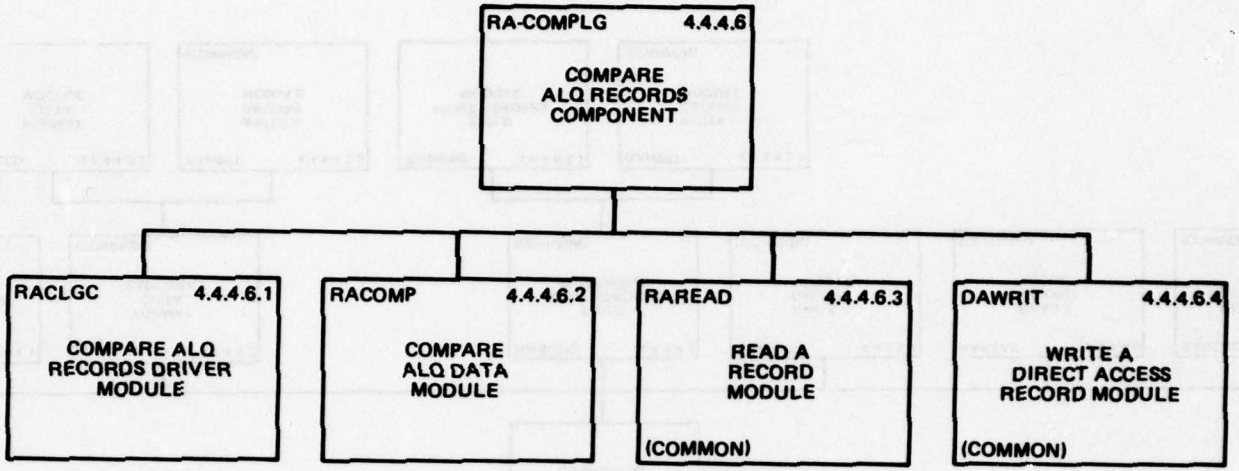


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (11 of 28)

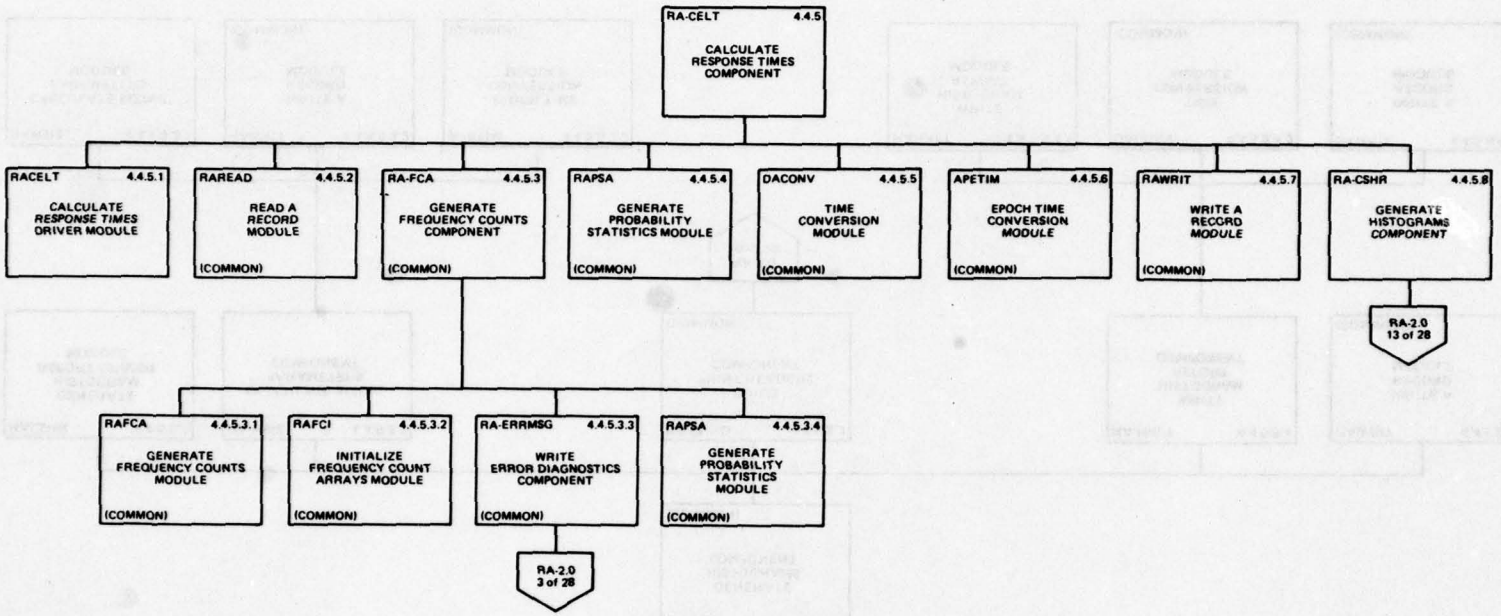


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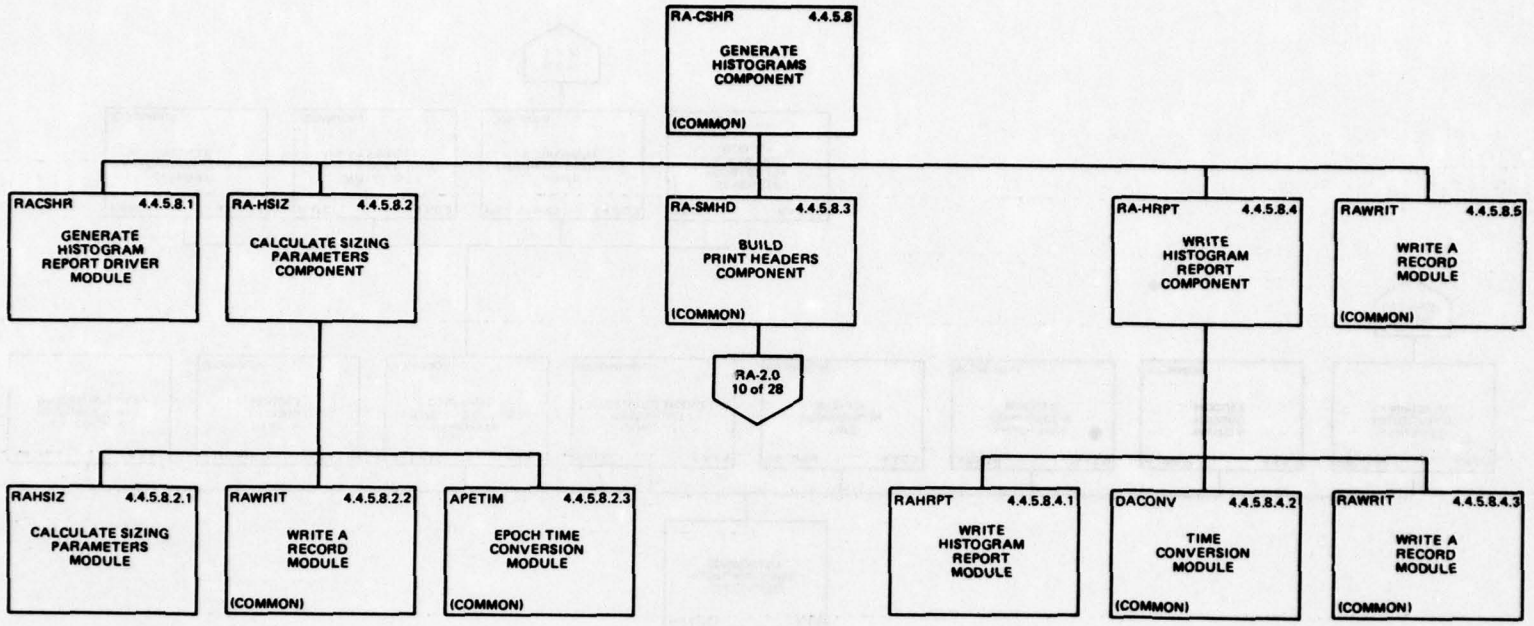


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (13 of 28)

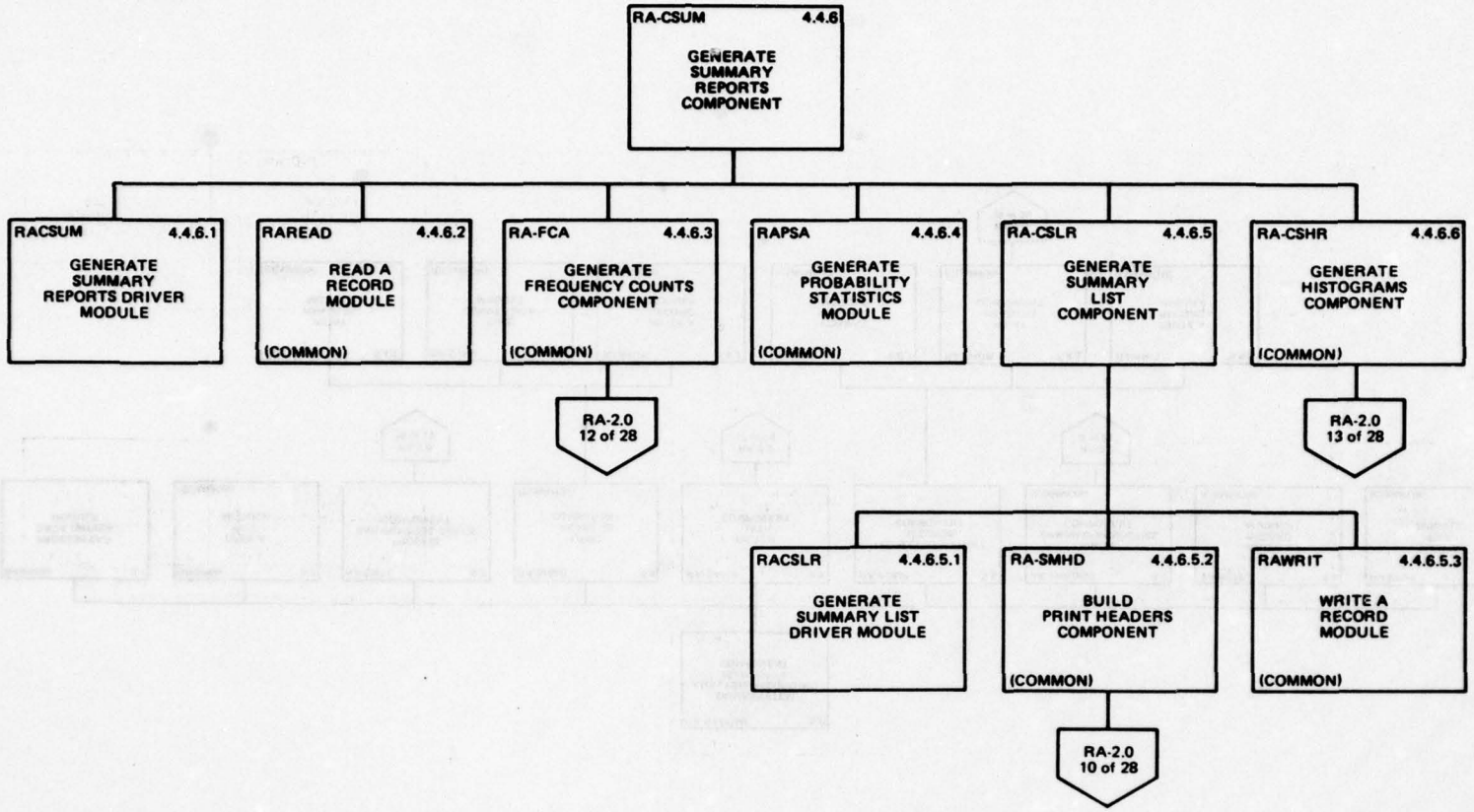


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (14 of 28)

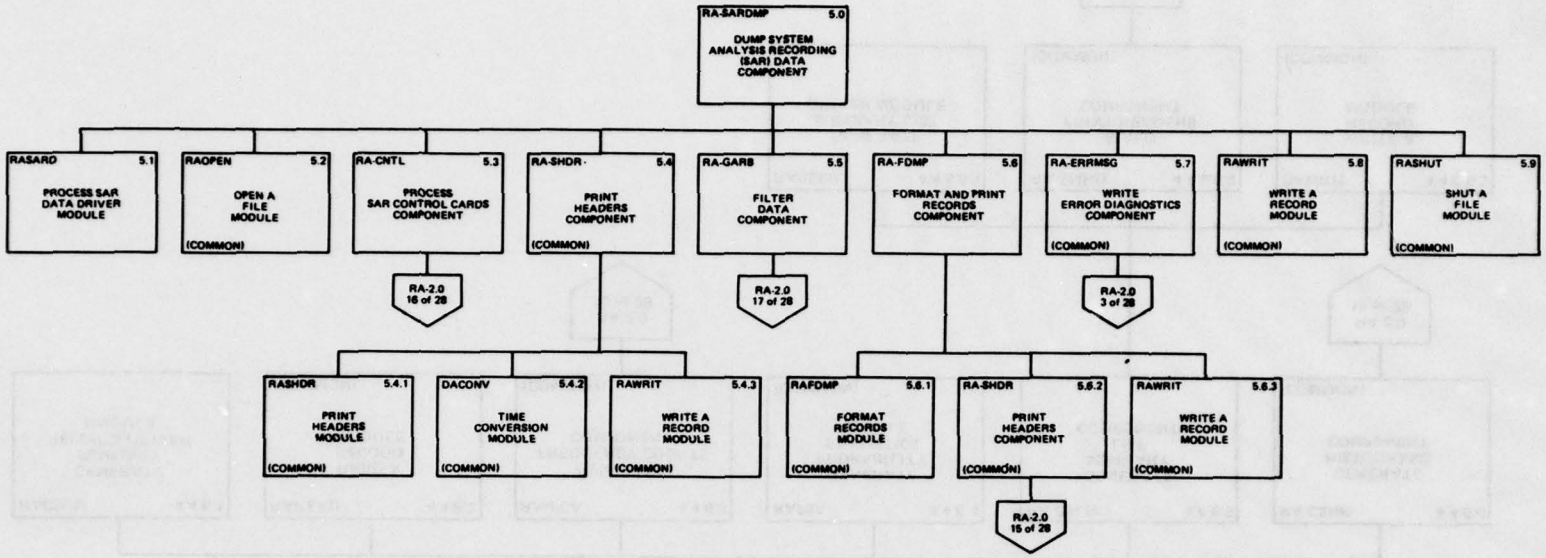


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (15 of 28)

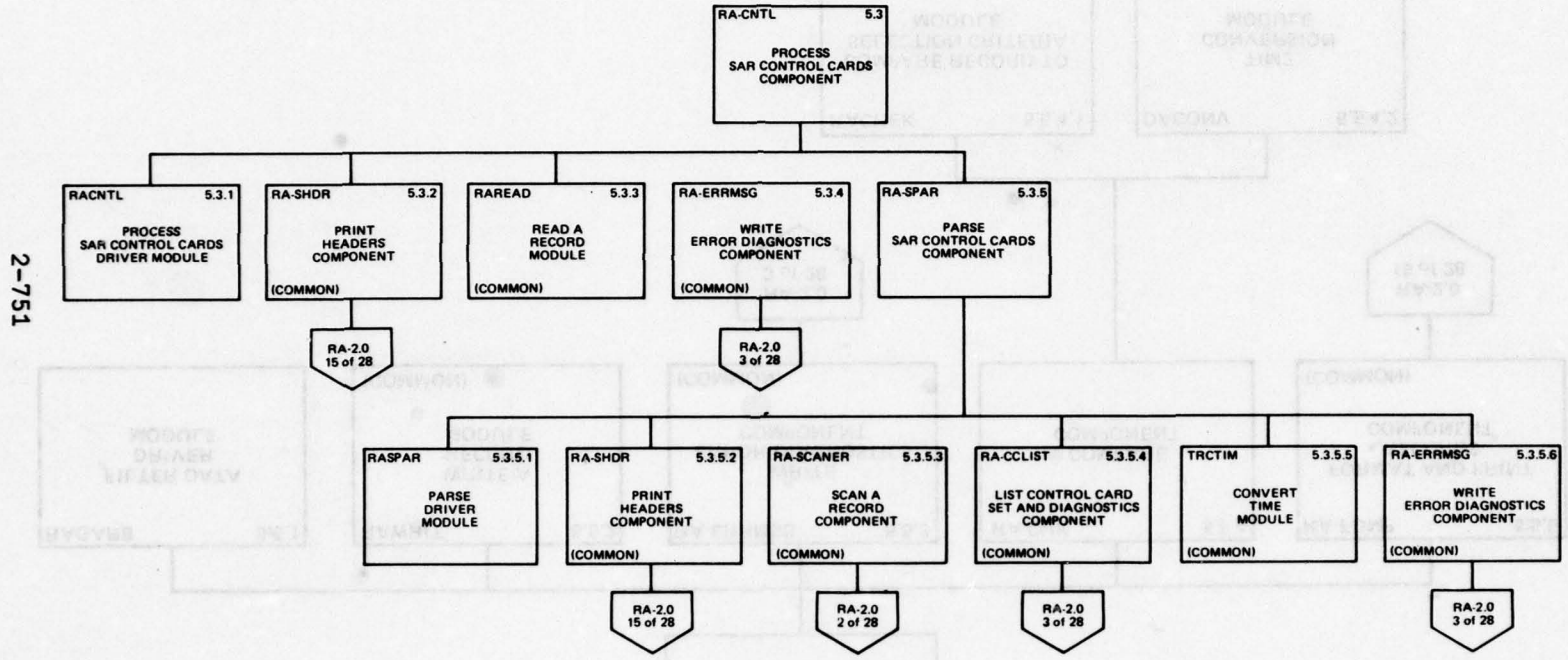


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (16 of 28)

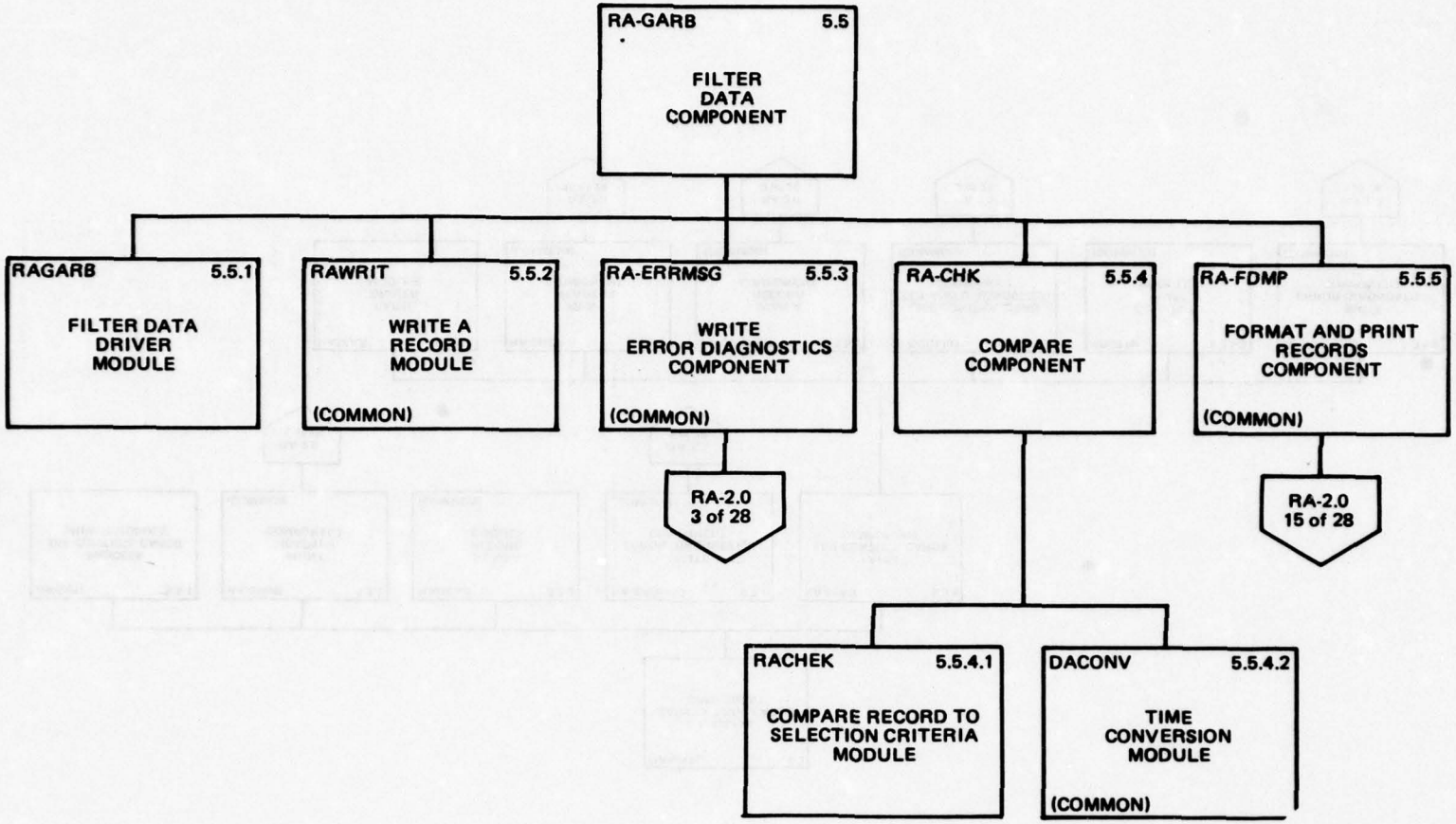


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (17 of 28)

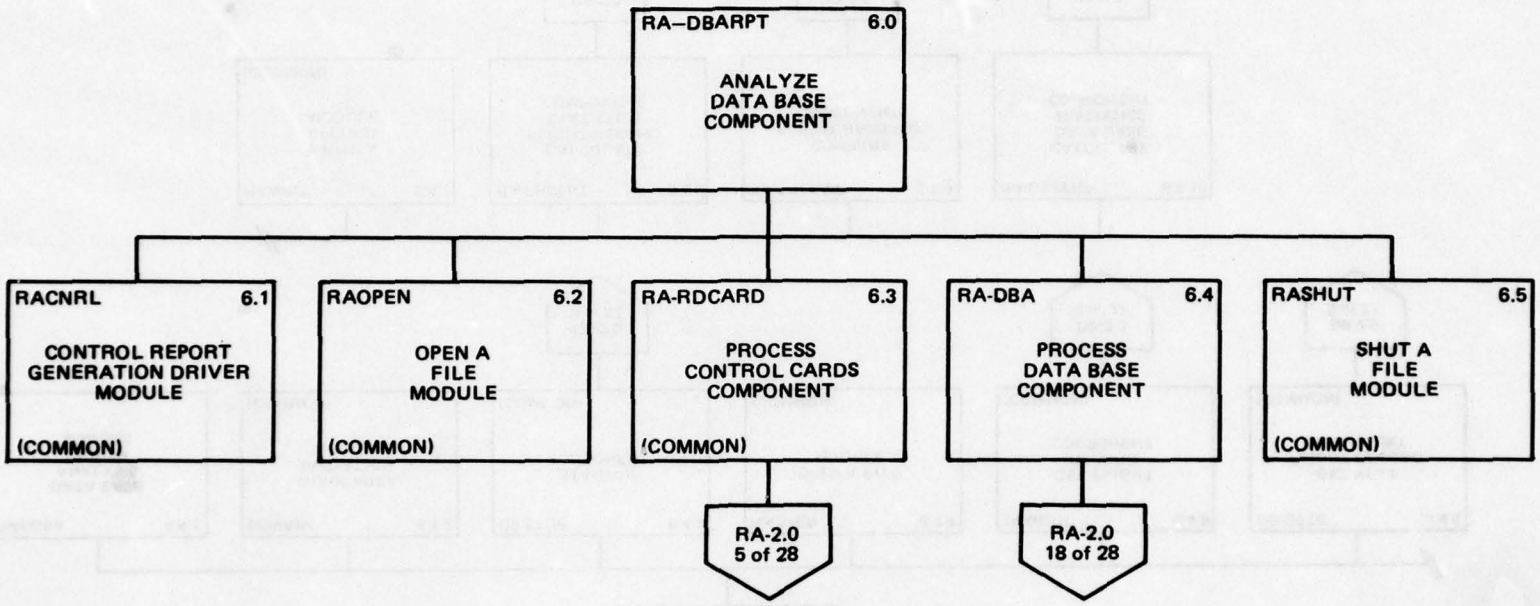


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (18 of 28)

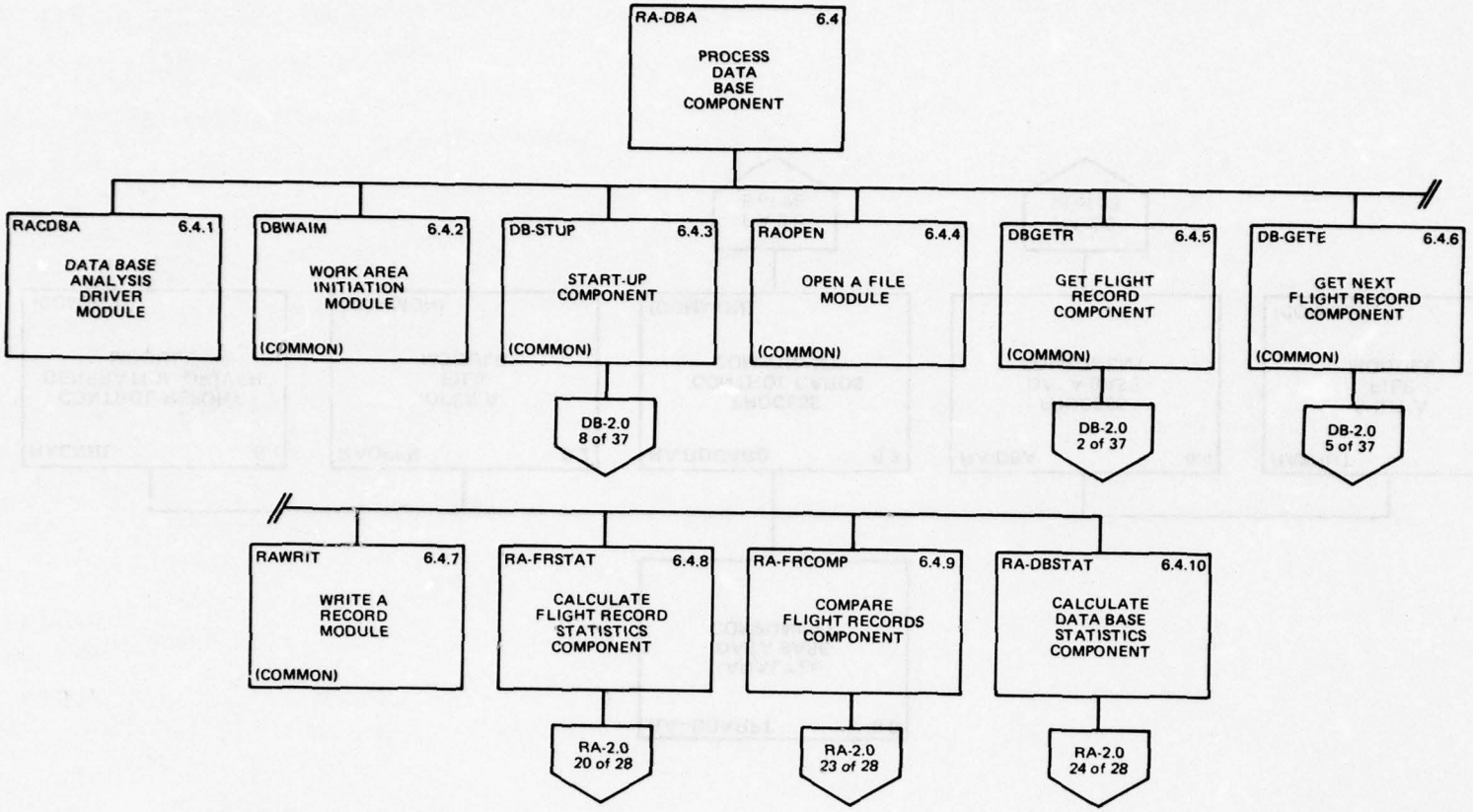


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (19 of 28)

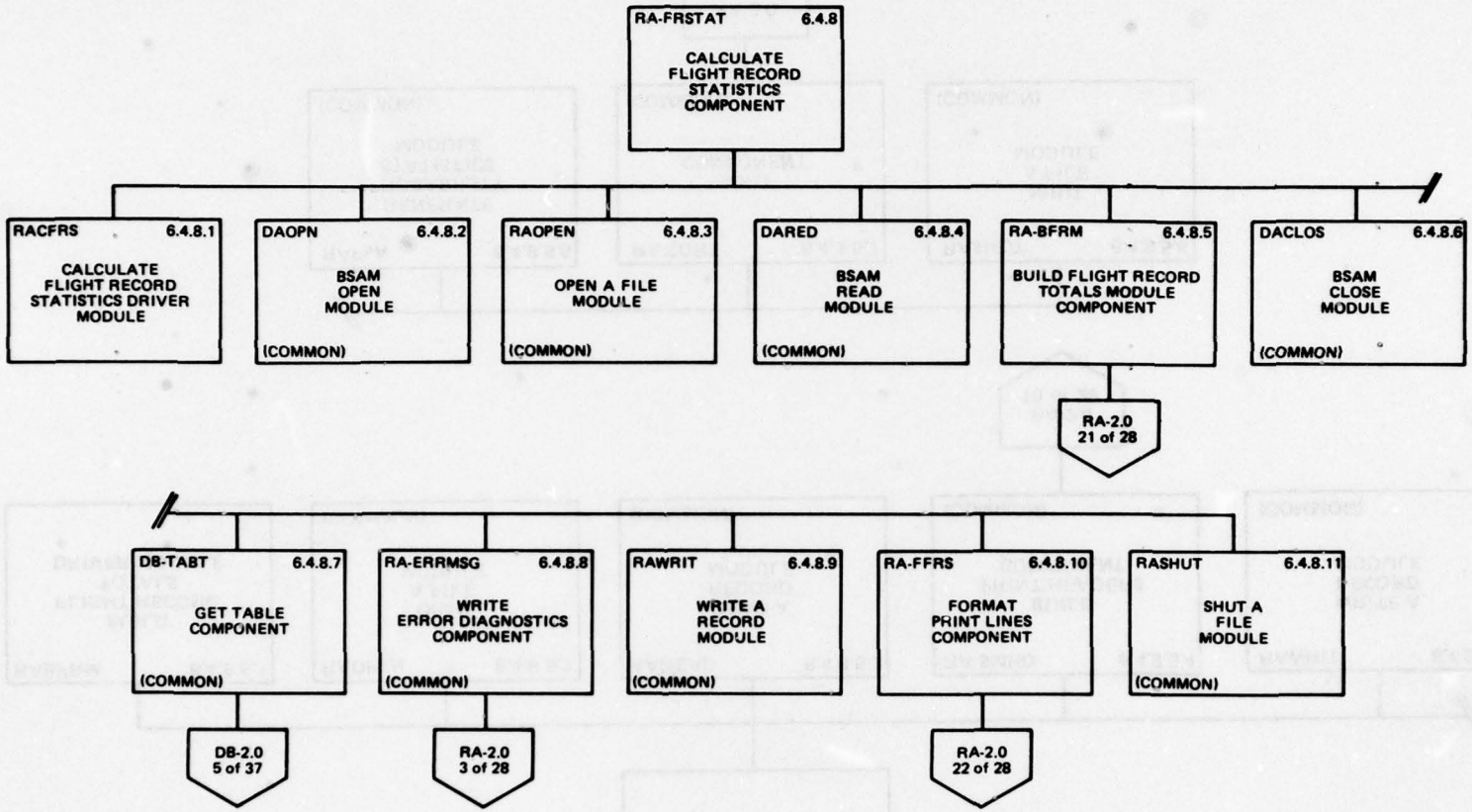


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (20 of 28)

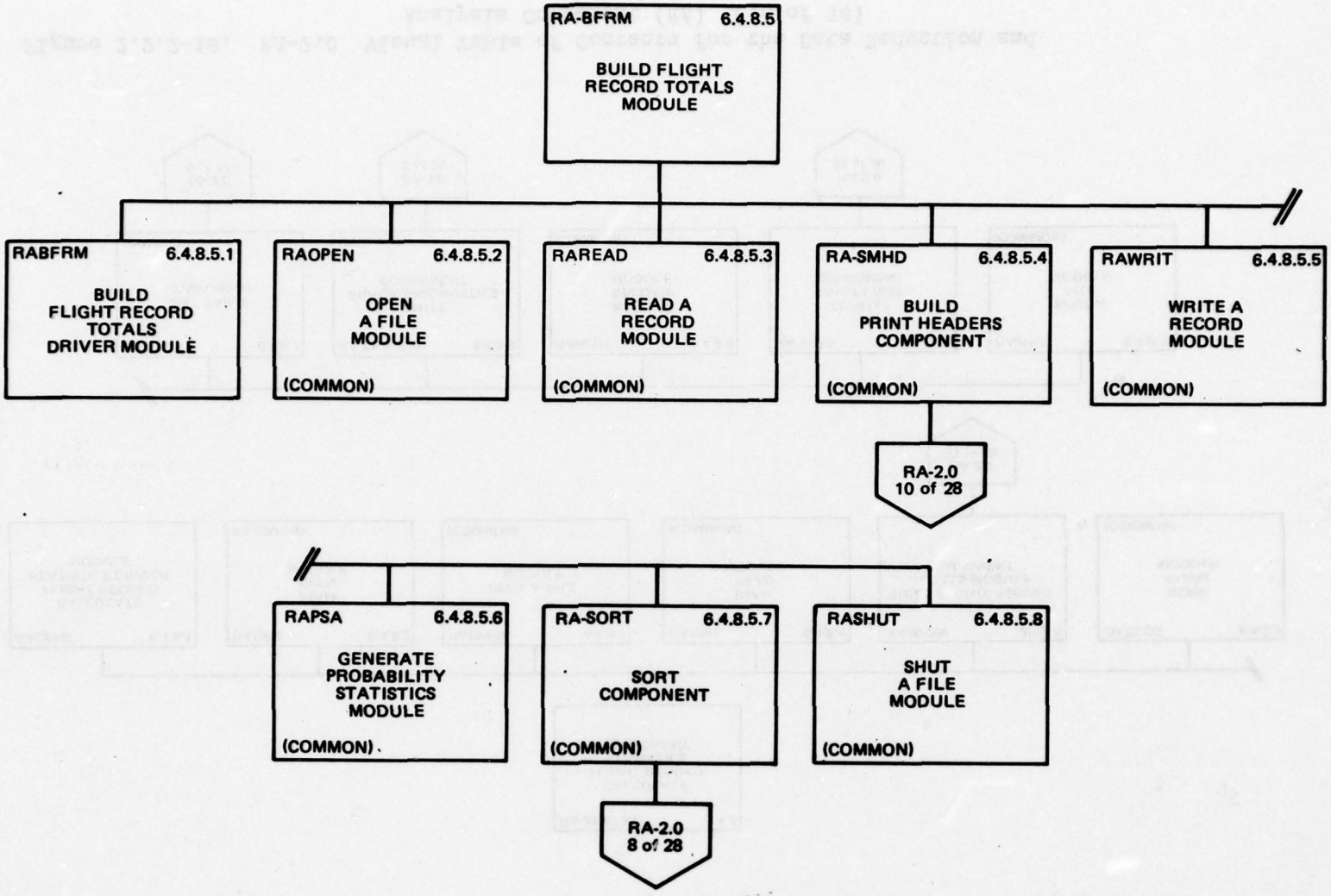


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (21 of 28)

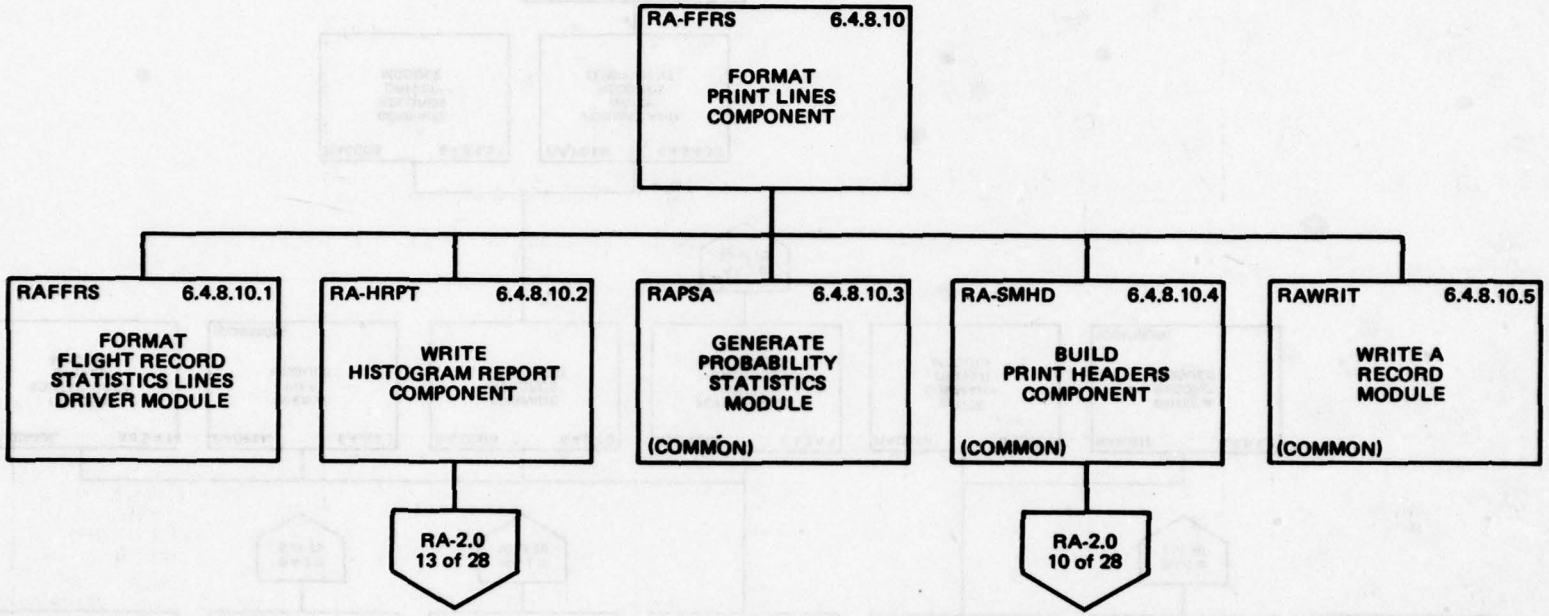


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (22 of 28)

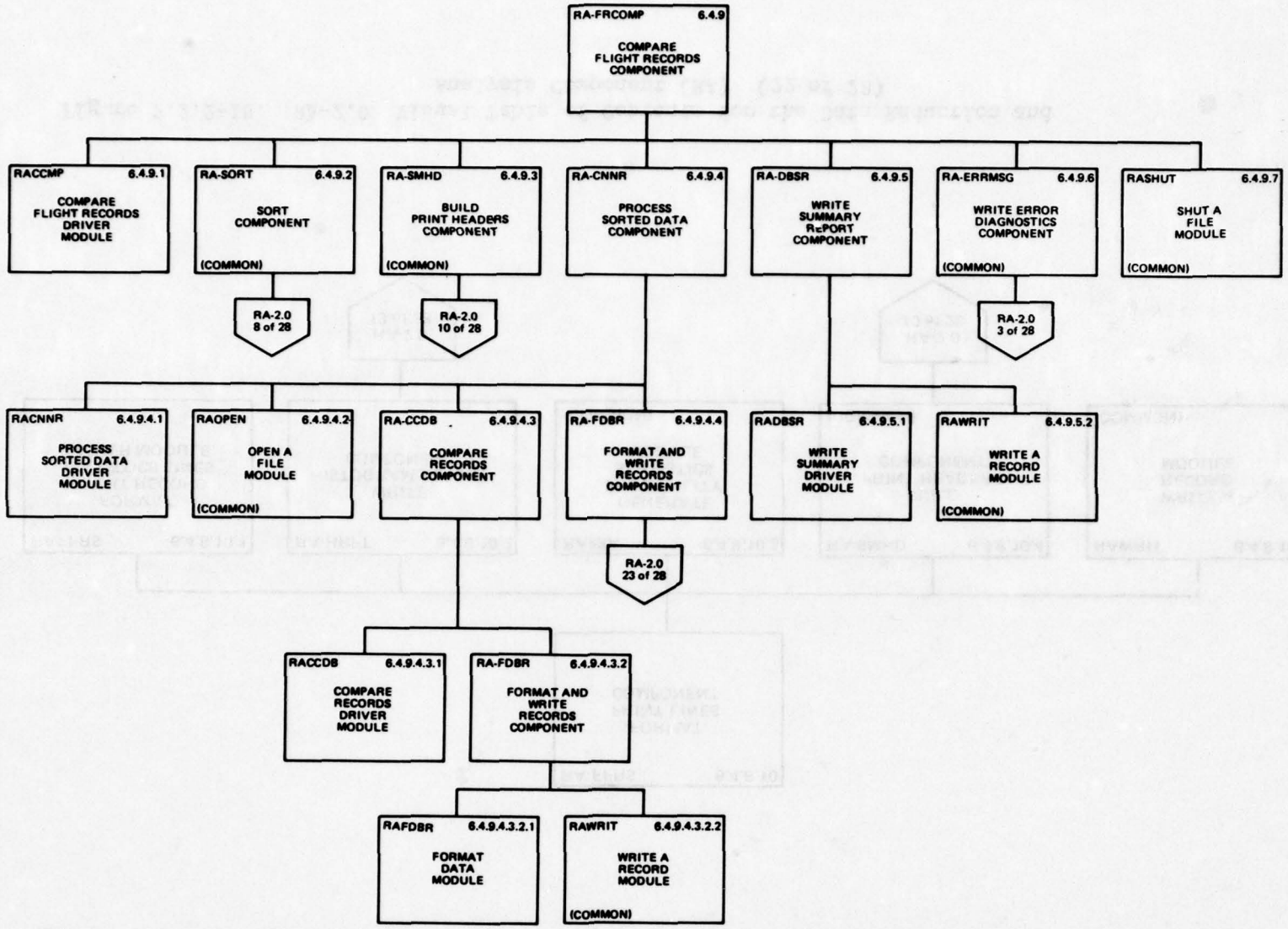


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (23 of 28)

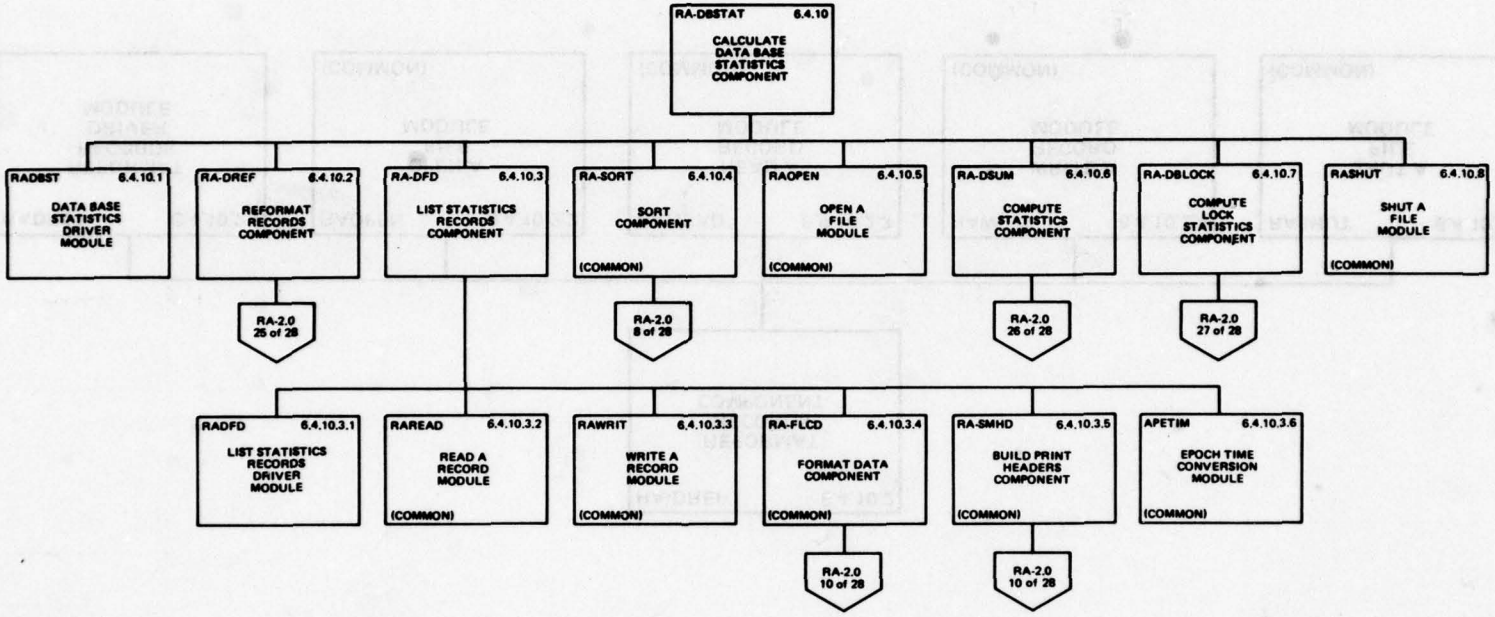


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (24 of 28)

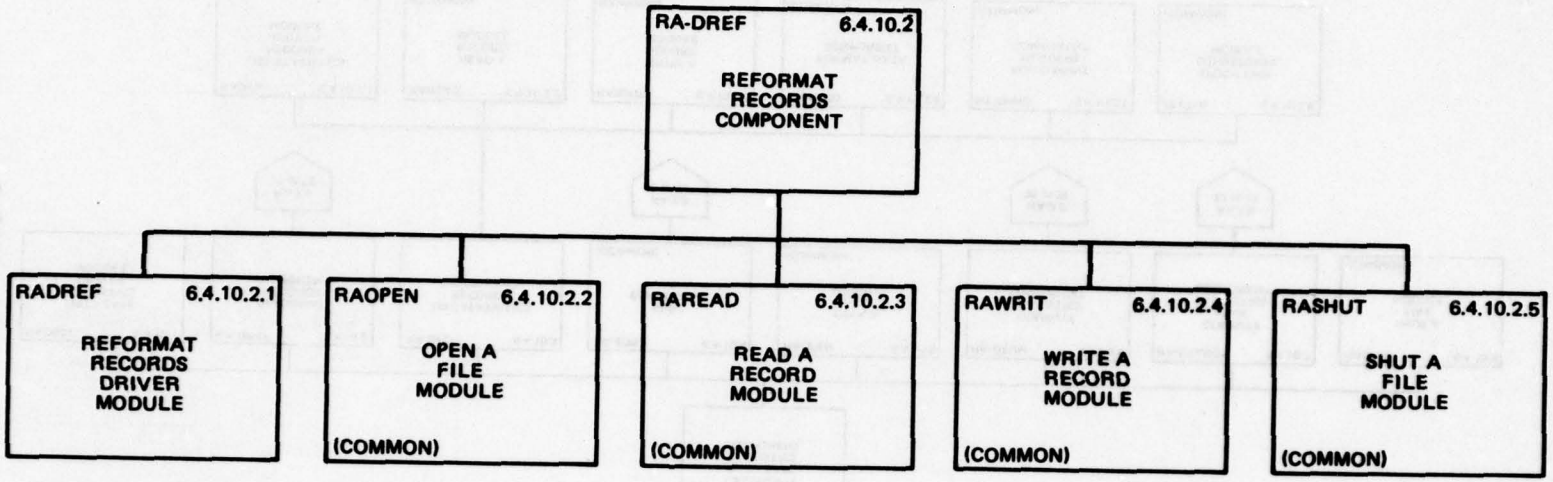


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (25 of 28)

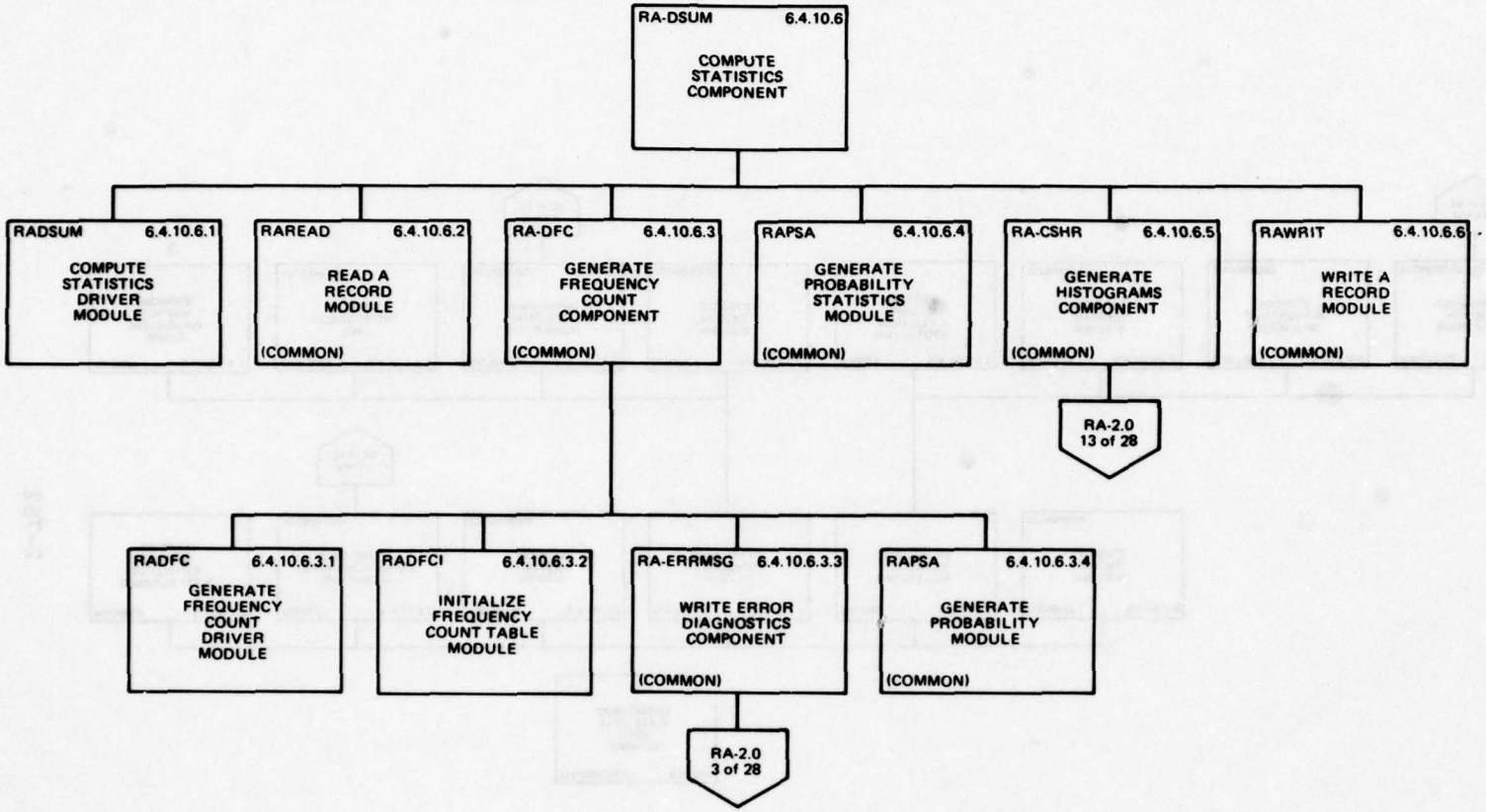


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (26 of 28)

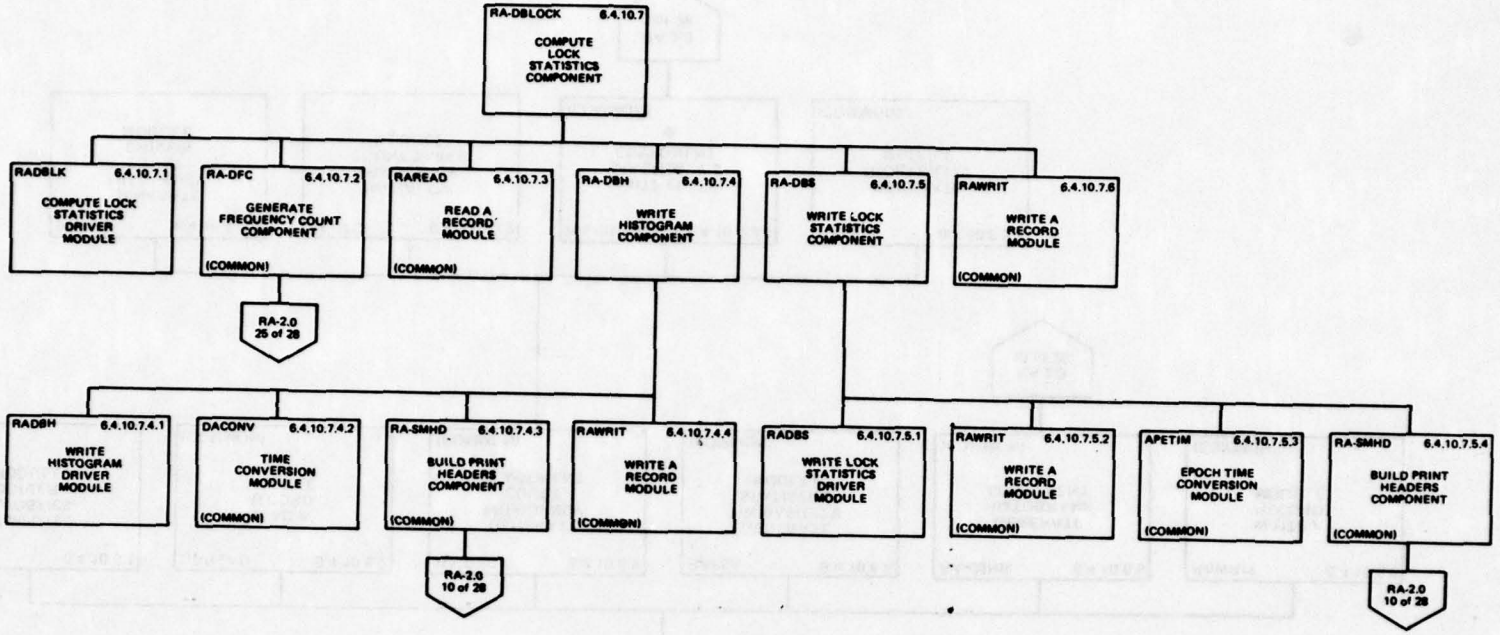


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (27 of 28)

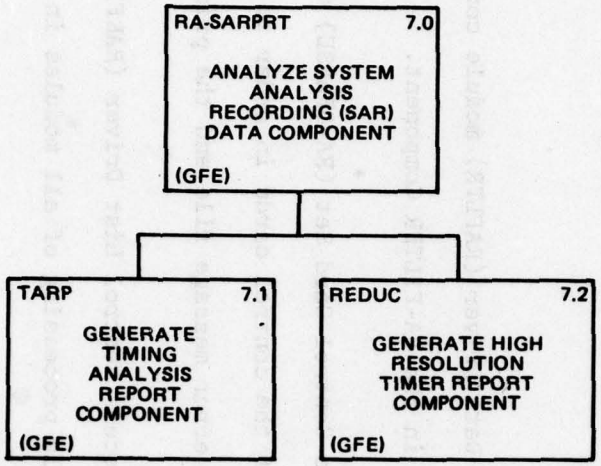


Figure 2.2.2-18. RA-2.0 Visual Table of Contents for the Data Reduction and Analysis Component (RA) (28 of 28)

2.2.2.4.1.6 Description Section for the Visual Table of Contents for the Data Reduction and Analysis (RA) Component

2.0 The Data RA Component is an offline set of programs designed to reduce, sort and analyze data recorded during online OPCX operations.

3.0 The Filter ALQ Data (RA-FILTER) Component filters an input ALQ tape based on user-specified filter criteria and outputs a filtered ALQ data set for use by the Analyze Filtered ALQ Data (RA-ALQRPT) Component.

3.1 The Filter ALQ Data Driver (RAFLTR) module controls processing of all modules in the RA-FILTER Component.

3.2 The Quick Parse Control Card Set (RA-QPARSE) Component performs a quick scan of the control cards in order to locate the DDNAMES of the error message file and the print file.

3.2.1 The Process Control List Driver (RAEFIL) Module controls processing of all modules in the RA-QPARSE component.

3.2.2 The Scan a Record (RA-SCANER) Component scans a control card buffer looking for predetermined delimiters and data fields and returns the item that was found.

3.2.2.1 The Scan a Record (RASCAN) Module scans the control card returning data fields or delimiters that were found.

3.2.2.2 The Verify a Data Item (RAVER) Module validates a data-field and returns a validation status.

3.2.3 The Open a File (RAOPEN) Module opens the error message file and print file.

3.2.4 The Shut a File (RASHUT) Module closes the print if errors occurred that result in terminating processing.

3.3 The Open a File (RAOPEN) Module opens the print file and the input and output data files.

3.4 The Read a Record (RAREAD) Module reads the control cards from the control card file into a core-resident buffer.

3.5 The Parse Control Card Set (RA-PARSE) Component scans control cards for filter criteria, verifies data fields, and lists control cards and appropriate diagnostic messages.

3.5.1 The Parse Control Card Set Driver (RAFPAR) Module controls processing of all modules in the RA-PARSE Component.

3.5.2 The Scan a Record (RA-SCANER) Component scans a control card buffer looking for predetermined delimeters and data fields and returns the item that was found.

3.5.2.1 The Scan A Record (RASCAN) Module scans the control card returning data fields or delimeters that were found.

3.5.2.2 The Verify a Data Item (RAVER) Module validates a data field and returns a validation status.

3.5.3 The Verify Numeric Data Item (RAVERN) Module validates input time fields.

3.5.4 The List Control Card Set and Diagnostics (RA-CCLIST) Component writes control cards and diagnostic messages to the print file.

3.5.4.1 The List Control Card Set Driver (RALSTC) Module controls the processing of the RA-CCLIST Component.

3.5.4.2 The Write Error Diagnostics (RA-ERRMSG) Component reads a specified diagnostic message from a partitioned data set and writes the message to the print file.

3.5.4.2.1 The Write Error Diagnostics Driver (RAEMSG) Module controls the processing of the RA-ERRMSG Component.

3.5.4.2.2 The Read a Record (RAREAD) Module reads the requested diagnostic message from the specified disk data set into core.

3.5.4.2.3 The Write a Record (RAWRIT) Module writes the diagnostic message to the print file.

3.5.4.3 The Write a Record (RAWRIT) Module writes the input control card image to the print file.

3.5.5 The Verify a Data Item (RAVER) Module validates the record type for record type selection.

3.5.6 The Build Field Value Verification Table (RA-FLDV) Component builds a table of filter criteria and verifies entries against predetermined values.

3.5.6.1 The Build Field Value Verification Table (RAFLDV) Module builds the table of filter criteria.

3.5.6.2 The Verify a Data Item (RAVER) Module validates a data-field and returns a validation status.

3.6 The Process Input Data (RA-INPUT) Component reads the input ALQ data set, selects records based on specified filter criteria, and writes selected records to an output data set.

3.6.1 The Process Input Data Sets Driver (RACPIN) Module controls the processing of all modules of the RA-INPUT Component.

3.6.2 The Read a Record (RAREAD) Module reads a record from the input ALQ data set.

3.6.3 The Filter Input Data (RA-FIL) Component processes an input ALQ data record and returns a status value indicating whether or not the record is to be accepted based on the filter criteria.

3.6.3.1 The Filter Data by Selected Criteria (RACFIL) Module controls the filter processing. The record is checked against the filter criteria and a status value is returned.

3.6.3.2 The Verify a Data-Item (RAVER) Module validates a field in the ALQ record against the table of filter criteria.

3.6.4 The Write a Record (RAWRIT) Module writes the ALQ record to a specified data set if it has been accepted by the RA-FIL Component.

3.6.5 The Write Error Diagnostics (RA-ERRMSG) Component writes a specified error message if any errors were encountered while processing the input data.

3.7 The Filter by Record Type (RA-FREC) Component processes the input ALQ data if the only filter criteria specified is record type. Only the specified record type is saved and written to the output filtered data set.

3.7.1 The Filter By Record Type (RAFREC) Module controls the processing of all modules of the RA-FREC Component. The record type is checked against the specified filter criteria and is accepted or rejected.

3.7.2 The Read a Record (RAREAD) Module reads a record from the input ALQ data set.

3.7.3 The Write a Record (RAWRIT) Module writes accepted records to the output data set.

3.8 The Write a Record (RAWRIT) Module writes header print lines and processing summary lines to the print data set.

3.9 The Shut a File (RASHUT) Module closes all previously opened files.

4.0 The Analyze Filtered ALQ Data (RA-ALQRPT) Component processes the filtered ALQ Data Set and generates reports based on user-supplied criteria.

4.1 The Control Report Generation Driver (RACNRL) Module controls processing of all modules in the RA-ALQRPT Component.

4.2 The Open a File (RAOPEN) Module opens the control card input file.

4.3 The Process Control Cards (RA-RDCARD) Component processes control cards and builds a table of reports requested and associated parameters.

4.3.1 The Process Control Cards Driver (RACRCD) Module controls processing of all modules in the RA-RDCARD Component.

4.3.2 The Read a Record (RAREAD) Module reads the control cards into a buffer.

4.3.3 The Scan a Record (RA-SCANER) Component is repeatedly called to scan the control card buffer until a TERM card is found signifying all control cards for a given report have been read into the buffer.

4.3.4 The Quick Parse Control Card Set (RA-QPARSE) Component performs a quick scan of the control cards in order to locate the DDNAMES of the error message file and the print file.

4.3.5 The Parse Control List (RA-CPAR) Component parses the control cards and builds the report control table.

4.3.5.1 The Parse Control List Driver (RACPAR) Module controls processing of all modules in the RA-CPAR component.

4.3.5.2 The Scan a Record (RA-SCANER) Component scans a control card buffer looking for predetermined delimiters and data fields and returns the item that was found.

4.3.5.3 The List Control Card Set and the Diagnostics (RA-CCLIST) Component writes control cards and diagnostics to the print file.

4.3.5.4 The Verify a Data Item (RAVER) Module validates a data field and returns a validation status.

4.3.5.5 The Verify Numeric Data Item (RAVERN) Module validates input time fields.

4.3.6 The Build Report Control Table (RA-CECT) Component verifies the completeness of the report control table.

4.3.6.1 The Build Report Control Table (RACECT) Module verifies that all required parameters for a report are present in the report control table.

4.3.6.2 The Write Error Diagnostics (RA-ERRMSG) Component writes appropriate diagnostic messages to the print file.

4.3.6.3 The Convert Time (TRCTIM) Module converts report times in HHMMSS to seconds.

4.3.7 The Write Error Diagnostics (RA-ERRMSG) Component writes appropriate diagnostic messages to the print file.

4.3.8 The Shut a File (RASHUT) Module closes all previously opened files.

4.4 The Analyze Filtered Data (RA-CAFD) Component processes the input filtered ALQ data set and generates the report requested as specified in the report control table.

4.4.1 The Analyze Filtered ALQ Data Driver (RACAFD) Module controls processing of all modules in the RA-CAFD Component.

4.4.2 The Sort (RA-SORT) Component sorts the filtered ALQ data set as requested in the sort control table using the utility Sort/Merge Program.

4.4.2.1 The Sort Driver (RACSRT) Module translates the sort criteria specified in the sort control table into the required parameter list format for linking to the sort/ merge program.

4.4.2.2 The General Sort (UT-SORT) Component sorts the filtered ALQ data set. This component is OS/9020 system utility Sort/Merge Program.

4.4.3 The Open a File (RAOPEN) Module opens the sorted file that was output by the Sort/Merge Program.

4.4.4 The List and/or Compare ALQ (RA-CLLC) Component lists the records of the filtered ALQ file or compares two filtered ALQ files and lists the mismatches and no hit records.

4.4.4.1 The List and/or Compare ALQ Driver (RACLLC) Module controls processing of all modules in the RA-CLLC Component.

4.4.4.2 The Open Direct Access File (DAOPEN) Module opens a direct access file for use as a work data set for comparing ALQ records.

4.4.4.3 The Read a Record (RAREAD) Module reads records from the input filtered ALQ file.

4.4.4.4 The Print ALQ Records (RA-LGPRNT) Component generates appropriate page headers, formats and writes the ALQ record.

4.4.4.4.1 The Print ALQ Records Driver (RALGPR) Module controls processing of all modules in the RA-LGPRNT Component.

4.4.4.4.2 The Format Data (RA-FLCD) Component formats the message data and writes it to the output file.

4.4.4.4.2.1 The Format Data (RAFLCD) Module formats the message data.

4.4.4.4.2.2 The Write a Record (RAWRIT) Module writes the message data to the output file.

4.4.4.4.3 The Build Print Headers (RA-SMHD) Component formats and writes the report header lines.

4.4.4.4.3.1 The Build Print Headers (RASMHD) Module formats the report header line.

4.4.4.4.3.2 The Write A Record (RAWRIT) Module writes the header to the output file.

4.4.4.4.4 The Write a Record (RAWRIT) Module writes the records from the filtered ALQ tape and writes statistics for the log comparison report.

4.4.4.4.5 The Read a Record (RAREAD) Module reads a record from a filtered ALQ tape.

4.4.4.4.6 The Read Direct Access Record (DAREAD) Module reads a direct access data set where records for the log comparison are stored.

4.4.4.5 The Read Direct Access Record (DAREAD) Module reads a direct access data set for the log comparison.

4.4.4.6 The Compare ALQ Records (RA-COMPLG) Component compares records from two ALQ files keeping all records for a given message together on a direct access file.

4.4.4.6.1 The Compare ALQ Records Driver (RACLGC) Module controls processing of all modules in the RA-COMPLG Component.

4.4.4.6.2 The Compare ALQ Data (RACOMP) Module compares two input messages and returns a comparison status.

4.4.4.6.3 The Read a Record (RAREAD) Module reads a record from either of the ALQ files.

4.4.4.6.4 The Write a Direct Access Record (DAWRIT) Module writes records to the direct access work data set.

4.4.4.7 The Write a Record (RAWRIT) Module writes lines of asterisks to separate records on log comparison report.

4.4.4.8 The Write Error Diagnostics (RA-ERRMSG) Component writes appropriate error diagnostics for the RA-CLLC Component.

4.4.4.9 The Close a Direct Access File (DASHUT) Module closes the direct access work data set.

4.4.5 The Calculate Response Times (RA-CELT) Component calculates message response times and generates histograms and statistical information.

4.4.5.1 The Calculate Response Times Driver (RACELT) Module controls processing of all modules in the RA-CELT Component.

4.4.5.2 The Read a Record (RAREAD) Module reads a record from the filtered ALQ data set.

4.4.5.3 The Generate Frequency Counts (RA-FCA) Component maintains the frequency count arrays and calculates the probability statistics.

4.4.5.3.1 The Generate Frequency Counts (RAFCA) Module updates the appropriate bin for the current response time.

4.4.5.3.2 The Initialize Frequency Count Arrays (RAFCI) Module clears the frequency count table and initializes the bins with the appropriate time value.

4.4.5.3.3 The Write Error Diagnostics (RA-ERRMSG) writes appropriate error diagnostics for the RA-FCA Component.

4.4.5.3.4 The Generate Probability Statistics (RAPSA) Module maintains the data necessary to compute mean, standard deviation, minimum, and maximum of a range of values.

4.4.5.4 The Generate Probability Statistics (RAPSA) Module computes the mean, standard deviation minimum, and maximum of a range of values.

4.4.5.5 The Time Conversion (DACONV) Module converts times in seconds to hours, minutes, and seconds for printing.

4.4.5.6 The Epoch Time Conversion (APETIM) Module converts times in seconds to a Gregorian date and time in hours, minutes, and seconds.

4.4.5.7 The Write a Record (RAWRIT) Module writes print lines of the response time summary report.

4.4.5.8 The Generate Histograms (RA-CHSR) Component calculates sizing parameters, writes header records, writes the histogram report lines, and writes the statistics line.

4.4.5.8.1 The Generate Histogram Report Driver (RACSHR) Module controls processing of all modules in the RA-CSHR Component.

4.4.5.8.2 The Calculate Sizing Parameters (RAHSIZ) Component processes the frequency array table, converts values to printable form, and writes the print lines.

4.4.5.8.2.1 The Calculate Sizing Parameters (RAHSIZ) Module formats the frequency count information.

4.4.5.8.2.2 The Write a Record (RAWRIT) Module writes the frequency count information.

4.4.5.8.2.3 The Epoch Time Conversion (APETIM) Module converts times in seconds to a Gregorian date and time in hours, minutes, and seconds.

4.4.5.8.3 The Build Print Headers (RA-SMHD) Component formats and writes the report header lines.

4.4.5.8.4 The Write Histogram Report (RA-HRPT) Component formats and writes the histogram print lines.

4.4.5.8.4.1 The Write Histogram Report (RAHRPT) Module formats the histogram print lines.

4.4.5.8.4.2 The Time Conversion (DACONV) Module converts report times in seconds to hours, minutes, and seconds for printing.

4.4.5.8.4.3 The Write a Record (RAWRIT) Module writes the histogram report print lines.

4.4.5.8.5 The Write a Record (RAWRIT) Module writes the statistics summary print line.

4.4.6 The Generate Summary Reports (RA-CSUM) Component reads a filtered ALQ tape and generates the statistical summary reports for the ALQ messages.

4.4.6.1 The Generate Summary Reports Driver (RACSUM) Module controls processing of all modules in the RA-CSUM Component.

4.4.6.2 The Read a Record (RAREAD) Module reads a record from the filtered ALQ data set.

4.4.6.3 The Generate Frequency Counts (RA-FCA) Component maintains the frequency count arrays and the data for computing the probability statistics.

4.4.6.4 The Generate Probability Statistics (RAPSA) Module computes the mean, standard deviation, minimum,and maximum of a range of values.

4.4.6.5 The Generate Summary List (RA-CSLR) Component formats and writes the headers for the summary reports.

4.4.6.5.1 The Generate Summary List Driver (RACSLR) Module controls processing of all modules in the RA-CSLR Component.

4.4.6.5.2 The Build Print Headers (RA-SMHD) Component formats and writes the report header lines.

4.4.6.5.3 The Write a Record (RAWRIT) Module writes the summary statistics line.

4.4.6.6 The Generate Histograms (RA-CSHR) Component calculates sizing parameters, writes header records, writes the histogram report,and writes the statistics line.

4.4.7 The Shut a File (RASHUT) Module shuts all previously opened files.

5.0 The Dump SAR Data (RA-SARDMP) Component formats and prints selected records from the SAR Data Set.

5.1 The Process SAR Data Driver (RASARD) Module controls processing of all modules in the RA-SARDMP Component.

5.2 The Open a File (RAOPEN) Module opens all files required by the RA-SARDMP Component.

5.3 The Process SAR Control Cards (RA-CNTL) Component scans control cards for filter criteria, verifies data fields, and lists control cards with appropriate diagnostic messages.

5.3.1 The Process SAR Control Cards Driver (RACNTL) Module controls processing of all modules in the RA-CNTL Component.

5.3.2 The Print Headers (RA-SHDR) Component prints the report header line.

5.3.3 The Read a Record (RAREAD) Module reads the control cards into a buffer.

5.3.4 The Write Error Diagnostics (RA-ERRMSG) Component writes an appropriate error diagnostic if no control cards were found.

5.3.5 The Parse SAR Control Cards (RA-SPAR) Component scans the control cards for keywords and associated values, builds the recording code and Program Element Identification (PEID) arrays, and lists the control cards and associated diagnostic messages.

5.3.5.1 The Parse Driver (RASPAR) Module controls processing of all modules in the RA-SPAR Component.

5.3.5.2 The Print Headers (RA-SHDR) Component formats and writes a header print line for the control card listing.

5.3.5.3 The Scan a Record Component (RA-SCANER) scans the control card buffer looking for predetermined delimiters and data fields and returns the item that was found.

5.3.5.4 The List Control Card Set and Diagnostics (RA-CCLIST) Component writes control cards and diagnostics to the print file.

5.3.5.5 The Convert Time (TRCTIM) Module converts times in HHMMSS to seconds.

5.3.5.6 The Write Error Diagnostics (RA-ERRMSG) Component writes appropriate error diagnostics.

5.4 The Print Headers (RA-SHDR) Component formats and writes the report header lines.

5.4.1 The Print Headers (RASHDR) Module determines if a control card heading or a SAR dump heading is to be written and formats the appropriate heading for printing.

5.4.2 The Time Conversion (DACONV) Module converts times in seconds to hours, minutes, and seconds.

5.4.3 The Write a Record (RAWRIT) Module writes the header print line to the print file.

5.5 The Filter Data (RA-GARB) Component determines if the input SAR record passes the filter criteria and formats and writes selected records.

5.5.1 The Filter Data Driver (RAGARB) Module controls processing of all modules in the RA-GARB Component.

5.5.2 The Write a Record (RAWRIT) Module writes messages to the print data set.

5.5.3 The Write Error Diagnostics (RA-ERRMSG) Component writes appropriate filter error diagnostics for the RA-GARB Component.

5.5.4 The Compare (RA-CHK) Component compares records to the selection criteria.

5.5.4.1 The Compare Record to Selection Criteria (RACHEK) Module compares the input SAR record to the filter criteria and returns a status flag.

5.5.4.2 The Time Conversion (DACONV) Module converts times in seconds to hours, minutes, and seconds.

5.5.5 The Format and Print Records (RA-FDMP) Component formats and writes SAR records.

5.6 The Format and Print Records (RA-FDMP) Component formats and writes selected SAR records to the print file.

5.6.1 The Format Records (RAFDMP) Module formats selected SAR records to be written to the print file.

5.6.2 The Print Headers (RA-SHDR) Component formats and writes the report heading at the top of each new print page.

5.6.3 The Write a Record (RAWRIT) Module writes the formatted SAR record to the print file.

5.7 The Write Error Diagnostics (RA-ERRMSG) Component writes appropriate error diagnostics to the print data set.

5.8 The Write a Record (RAWRIT) Module writes the SAR dump summary print lines.

5.9 The Shut a File (RASHUT) Module shuts all previously opened files.

6.0 The Analyze Data Base (RA-DBARPT) Component processes the user-supplied control cards and performs the requested data base function: data-base startup, flight record file comparison, flight record file analysis, and data base statistical analysis.

6.1 The Control Report Generation Driver (RACNRL) Module controls the processing of the Analyze Data Base Component.

6.2 The Open a File (RAOPEN) Module opens the control card input file.

6.3 The Process Control Cards (RA-RDCARD) Component processes control cards and builds a table of reports requested and associated parameters.

6.4 The Process Data Base (RA-DBA) Component creates an offline copy of the data base, calculates flight record statistics, compares flight record files, or computes data base access statistics.

6.4.1 The Data Base Analysis Driver (RACDBA) Module controls the processing of the Process Data Base (RA-DBA) Component.

6.4.2 The Data Base Work Area Module (DBWAIN) establishes addressability to the data base work area.

6.4.3 The Startup (DB-STUP) Component creates an updated copy of the data base on the offline system by reading the backup copy of the data base and the associated data base recovery sets.

6.4.4 The Open a File (RAOPEN) Module opens the output sets for Flight Record if the report request is flight record comparison.

6.4.5 The Get Flight Record (DB-GETR) Component retrieves the first flight record from either the OAG Flight Record Set or the Non-OAG Flight Record Set.

6.4.6 The Get Next Flight Record (DB-GETE) Component retrieves successive flight records from either the OAG Flight Record Set or the Non-OAG Flight Record Set.

6.4.7 The Write a Record (RAWRIT) Module writes the flight records to a temporary file for further processing by the Compare Flight Records (RA-FRCOMP) Component.

6.4.8 The Calculate Flight Record Statistics (RA-FRSTAT) Component retrieves the OAG Flight Record Set and the Non-OAG Flight Record Set and generates statistics by arrival terminal, departure terminal, and arrival/departure pairs.

6.4.8.1 The Calculate Flight Record Statistics Driver (RACFRS) Module controls the processing of the Calculate Flight Record Statistics (RA-FRSTAT) Component.

6.4.8.2 The BSAM Open (DAOPN) Module opens the Data Base Sets that are required by the RA-FRSTAT Component.

6.4.8.3 The Open a File (RAOPEN) Module opens for output a temporary set used for maintaining flight record statistics prior to generating the report.

6.4.8.4 The BSAM Read (DARED) Module reads blocks of records from the OAG or Non-OAG Flight Record Sets.

6.4.8.5 The Build Flight Record Totals (RA-BFRM) Component calculates and prints the flight record totals by arrival terminal, departure terminal, and arrival/departure pair.

6.4.8.5.1 The Build Flight Record Totals Driver (RABFRM) Module controls processing of the Build Flight Record Totals (RA-BFRM) Component.

6.4.8.5.2 The Open a File (RAOPEN) Module opens for input the sorted set containing the flight record statistics.

6.4.8.5.3 The Read a Record (RAREAD) Module reads the sorted set for the flight record statistics.

6.4.8.5.4 The Build Print Headers (RA-SMND) Component formats and writes the report header lines.

6.4.8.5.5 The Write a Record (RAWRIT) Module writes the report statistics lines.

6.4.8.5.6 The Generate Probability Statistics (RAPSA) Module stored the total flights for generation of probability statistics.

6.4.8.5.7 The Sort (RA-SORT) Component sorts the flight record totals stored on the temporary data set by either arrival or departure terminal.

6.4.8.5.8 The Shut a File (RASHUT) Module closes the sorted data set after processing is complete.

6.4.8.6 The BSAM Close (DACLOS) Module closes the OAG or Non-OAG Flight Record Set after processing is complete.

6.4.8.7 The Get Table (DB-TABT) Component accesses the Airport Table to retrieve the external codes for the arrival and departure terminals.

6.4.8.8 The Write Error Diagnostics (RA-ERRMSG) Component writes appropriate error diagnostics to the print data set.

6.4.8.9 The Write a Record (RAWRIT) Module writes flight record totals to the temporary set.

6.4.8.10 The Format Print Lines (RA-FFRS) Component formats and writes the histogram and report summary lines.

6.4.8.10.1 The Format Flight Record Statistics Lines Driver (RAFFRS) Module controls processing of the Format Print Lines (RA-FFRS) Component.

6.4.8.10.2 The Write Histogram Report (RA-HRPT) Component writes the report histogram.

6.4.8.10.3 The Generate Probability Statistics Module (RAPSA) generates the probability statistics.

6.4.8.10.4 The Build Print Headers (RA-SMHD) Component formats and writes the report header lines.

6.4.8.10.5 The Write a Record (RAWRIT) Module writes the report summary lines.

6.4.8.11 The Shut a File (RASHUT) Module closes the temporary set when processing of it is complete.

6.4.9 The Compare Flight Records (RA-FRCOMP) Component compares two input OAG Flight Record Sets and two input Non-OAG Flight Record Sets and lists any discrepancies in the sets.

6.4.9.1 The Compare Flight Records Driver (RACCMP) Module controls processing of the Compare Flight Records (RA-FRCOMP) Component.

6.4.9.2 The Sort Component (RA-SORT) sorts the flight record sets by arrival terminal, departure terminal, aircraft identification, and departure time.

6.4.9.3 The Build Print Headers (RA-SMHD) Component formats and writes the report header line.

6.4.9.4 The Process Sorted Data (RA-CNNR) Component compares the flight records on the sorted sets and prints any records in which there are discrepancies.

6.4.9.4.1 The Process Sorted Data Driver (RACNNR) Module controls the processing of the Process Sorted Data (RA-CNNR) Component.

6.4.9.4.2 The Open a File (RAOPEN) Module opens the sorted flight record sets to be processed.

6.4.9.4.3 The Compare Records (RA-CCDB) Component compares the records from the input sorted sets and writes the records if a discrepancy is found.

6.4.9.4.3.1 The Compare Records Driver (RACCDB) Module controls the processing of the Compare Records (RA-CCDB) Component and performs the record comparison.

6.4.9.4.3.2 The Format and Write Records (RA-FDBR) Component formats and writes the mismatched or no-match records.

6.4.9.4.3.2.1 The Format Data (RAFDBR) Module formats the flight records for printing.

6.4.9.4.3.2.2 The Write a Record (RAWRIT) Module writes the flight records to the report data set.

6.4.9.4.4 The Format and Write Records (RA-FDBR) Component formats and writes the remaining records on one set if an end-of-data was encountered on the alternate set.

6.4.9.5 The Write Summary Report (RA-DBSR) Component writes the report summary showing total number of records compared, number of matches, and number of mismatches.

6.4.9.5.1 The Write Summary Driver (RADBSR) Module formats the summary print lines and calls the Write a Record (RAWRIT) Module to write the report summary.

6.4.9.5.2 The Write a Record (RAWRIT) Module writes the report summary lines.

6.4.9.6 The Write Error Diagnostics (RA-ERRMSG) Component writes appropriate error diagnostics.

6.4.9.7 The Shut a File (RASHUT) Module closes all previously opened files.

6.4.10 The Calculate Data Base Statistics (RA-DBSTAT) Component lists the data base statistics records from the Archive Log Queue (ALQ) Set, and computes statistical information on data base table usage.

6.4.10.1 The Data Base Statistics Driver (RADBST) Module controls processing of the Calculate Data Base Statistics (RA-DBSTAT) Component.

6.4.10.2 The Reformat Records (RA-DREF) Component reads the data base statistics records from the input Filtered ALQ Set, reformats the data and writes the reformatted records to a work data set.

6.4.10.2.1 The Reformat Records Driver (RADREF) Module controls processing of the Reformat Records (RA-DREF) Component and reformats the statistics records.

6.4.10.2.2 The Open a File (RAOPEN) Module opens the input ALQ set and the output set to contain the reformatted records.

6.4.10.2.3 The Read a Record (RAREAD) Module reads records from the input ALQ set.

6.4.10.2.4 The Write a Record (RAWRIT) Module writes the reformatted records to a work data set.

6.4.10.2.5 The Shut a File (RASHUT) Module closes the work data set.

6.4.10.3 The List Statistics Records (RA-DFD) Component reads the statistic records from the input Filtered ALQ Set and produces a formatted listing of the records.

6.4.10.3.1 The List Statistics Records Driver (RADFD) Module controls processing of the List Statistics Records (RA-DFD) Component and formats the records for printing.

6.4.10.3.2 The Read a Record (RAREAD) Module reads the records from the input ALQ set.

6.4.10.3.3 The Write a Record (RAWRIT) Module writes the records to the output print file.

6.4.10.3.4 The Format Data (RA-FLCD) Component formats the data base statistics records for printing.

6.4.10.3.5 The Build Print Headers (RA-SMHD) formats and writes the report header lines.

6.4.10.3.6 The Epoch Time Conversion (APETIM) Module converts times in seconds to a Gregorian date and time in hours, minutes, and seconds.

6.4.10.4 The Sort (RA-SORT) Component sorts the reformatted records on the work data set according to user-specified criteria.

6.4.10.5 The Open a File (RAOPEN) Module opens the sorted file for input processing.

6.4.10.6 The Compute Statistics (RA-DSUM) Component generates the statistics on data base accesses and response times.

6.4.10.6.1 The Compute Statistics Driver (RADSUM) Module controls processing of the Compute Statistics (RA-DSUM) Component.

6.4.10.6.2 The Read a Record (RAREAD) Module reads statistics records from the sorted file.

6.4.10.6.3 The Generate Frequency Count (RA-DFC) Component maintains the frequency count arrays and calculates the probability statistics.

6.4.10.6.3.1 The Generate Frequency Count Driver (RADFC) Module controls processing of the Generate Frequency Count (RA-DFC) Component.

6.4.10.6.3.2 The Initialize Frequency Count Table (RADFCI) Module initializes the frequency count arrays.

6.4.10.6.3.3 The Write Error Diagnostics (RA-ERRMSG) Component writes appropriate error diagnostic messages.

6.4.10.6.3.4 The Generate Probability Statistics (RAPSA) Module stores the totals for the probability statistics calculations.

6.4.10.6.4 The Generate Probability Statistics (RAPSA) Module computes the probability statistics.

6.4.10.6.5 The Generate Histograms (RA-CSHR) Component calculates sizing parameters, writes header records, writes the histogram report lines, and writes the statistics line.

6.4.10.6.6 The Write a Record (RAWRIT) Module writes the report summary lines.

6.4.10.7 The Compute Lock Statistics (RA-DBLOCK) Component computes data base lock queue statistics including number of locks on a specified table and length of table lock-out time.

6.4.10.7.1 The Compute Lock Statistics Driver (RADBLK) Component controls processing of the Compute Lock Statistics (RA-DBLOCK) Component.

6.4.10.7.2 The Generate Frequency Count (RA-DFC) Component maintains the frequency count arrays and calculates the probability statistics.

6.4.10.7.3 The Read a Record (RAREAD) Module reads the data base statistics records from the sorted file.

6.4.10.7.4 The Write Histogram (RA-DBH) Component generates the lock queue statistics histogram report.

6.4.10.7.4.1 The Write Histogram Driver (RADBH) Module controls processing of the Write Histogram (RA-DBH) Component.

6.4.10.7.4.2 The Time Conversion (DACONV) Module converts times in seconds to hours, minutes, and seconds for printing.

6.4.10.7.4.3 The Build Print Headers (RA-SMHD) Component formats and writes the report header lines.

6.4.10.7.4.4 The Write a Record (RAWRIT) Module writes the histogram print lines.

6.4.10.7.5 The Write Lock Statistics (RA-DBS) Component writes the lock statistics to the report data set.

6.4.10.7.5.1 The Write Lock Statistics Driver (RADBS) Module controls processing of the Write Lock Statistics (RA-DBS) Component.

6.4.10.7.5.2 The Write a Record (RAWRIT) Module writes the statistics print lines.

6.4.10.7.5.3 The Epoch Time Conversion (APETIM) Module converts times in seconds to a Gregorian date and time in hours, minutes, and seconds.

6.4.10.7.5.4 The Build Print Headers (RA-SMHD) Component formats and writes the report header lines.

6.4.10.7.6 The Write a Record (RAWRIT) Module writes the report summary lines.

6.4.10.8 The Shut a File (RASHUT) Module shuts all previously opened files.

6.5 The Shut a File (RASHUT) Module closes the report and error message files.

7.0 The Analyze OPCX Performance (RA-SYSPER) Component uses government-furnished software to generate timing analysis reports, high resolution timer reports, and resource utilization reports.

7.1 The Generate Timing Analysis Report (TARP) Component is government-furnished software to generate summary reports of 10 records filtered from the SAR tape. A simulated High-Resolution Timer (HRT) Tape may also be produced.

7.2 The Generate High Resolution Timer Report (REDUC) Component is government-furnished software to generate OPCX timing analysis reports from a High-Resolution Timer (HRT) Tape simulated by TARP.

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CENTRAL FLOW CONTROL. SOFTWARE DESIGN DOCUMENT. VOLUME II. SUPP--ETC(U)
JAN 79 DOT-FA77WA-3955

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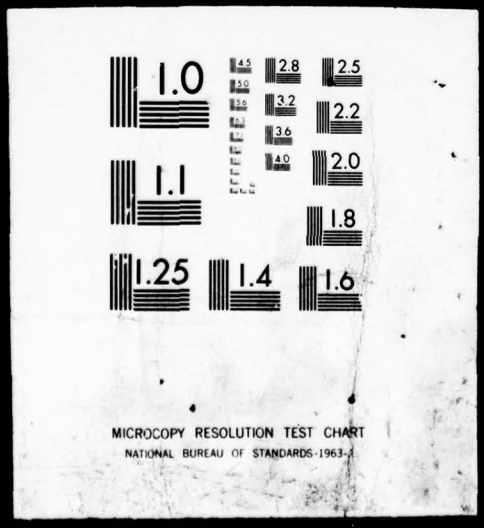
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2.2.2.4.2 Automated Code Auditor and Data Dictionary Build (MA) Component

a. Purpose. The purpose of the Automated Code Auditor and Data Dictionary Build (MA) Component is to perform off-line processing and analysis of module prologues and PDLs for completeness and consistency with respect to the CFC Quality Assurance Standards. Additionally, the MA Component creates a module level test specification and a data item dictionary.

b. Component Overview. The MA Component consists of two programs designed to analyze PDL and prologues through the Automated Code Auditor Component and to build the data item dictionary as the Data Item Dictionary Build Component. Each of these components is respectively discussed in the following sections. Figure 2.2.2-19 is the overview diagram for the MA Component.

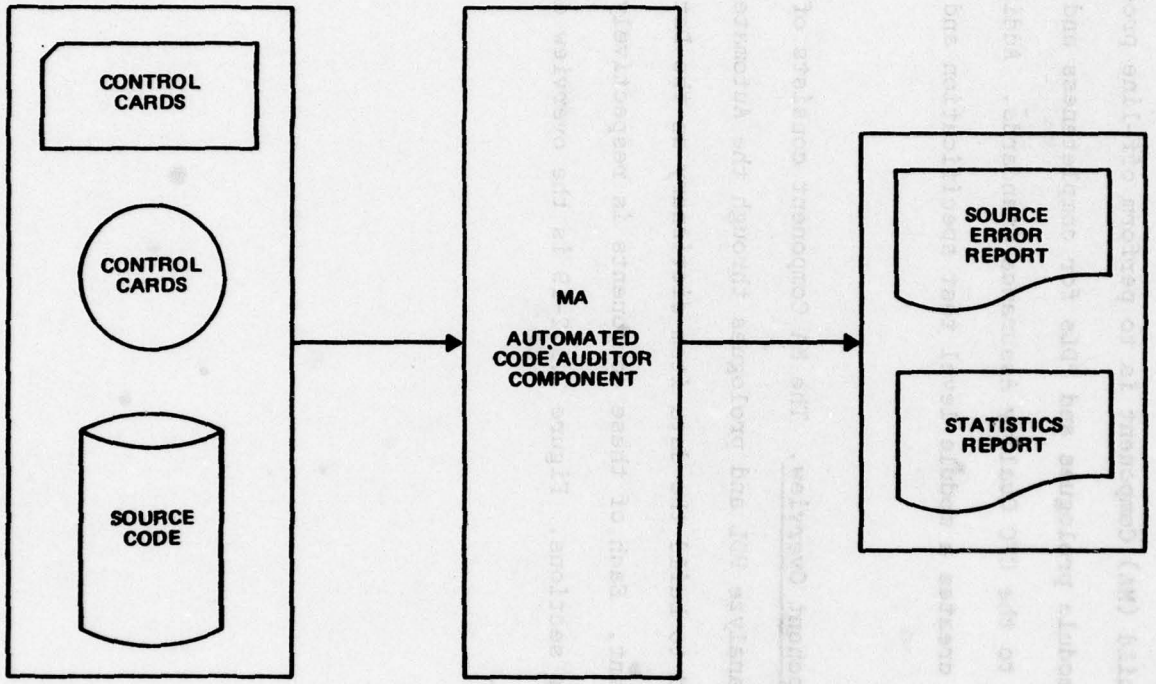


Figure 2.2.2-19. MA-1.0 Automated Code Auditor Component (MA) System Level Overview

2.2.2.4.2.1 Automated Code Auditor Component

a. Purpose. The Automated Code Auditor (MACA) is an offline program which provides the following services:

- Analysis of Module Prologues for completeness and conformance to standards
- Parsing of Program Design Language (PDL) for proper use of keywords and design constructs.
- Generation of Test Specification charts from the PDL

b. Functional Description. The Automated Code Auditor consists of a driver module and four sub-components. The Code Auditor is entered through MAEX, the driver module. The MA-INPCC Component is called once to process control cards and write the control card listing. For each module to be analyzed, the following components are called:

- MA-INPSRC, which reads and scans the module to be analyzed
- MA-CHECK, which performs the prologue analysis
- MA-RPT, which writes all reports except the control card listing

c. Input. Input to the Code Auditor consists of the following:

- Program Control Cards
- Module Prologue/PDL resident on a partitioned data set
- Keyword tables defining prologue and PDL keywords

d. Output. Output from the Code Auditor consists of the following:

- Prologue/PDL listing with diagnostic error messages
- Test Specification chart

2.2.2.4.2.1.1 MA-INPCC, Process Control Cards Component

a. Purpose. The purpose of the Process Control Cards Component (MA-INPCC) is to open all files, process control cards, and build the Executive Control Set defining modules to be analyzed and their associated list options.

b. Functional Description. MAECT, the driver module for the Process Control Cards Component (MA-INPCC), initializes all tables whose values are set by this component. MAGET is called to read the control cards into core MABECT is called to parse these card images and build the Executive Control Set MASORT is called to sort the diagnostic message set, and MALSC is called to write the control card listing.

c. Input. Input to the MA-INPCC Component consists of the program control cards.

d. Output. Output of the MA-INPCC Component consists of the following:

- Executive Control Set
- Control card listing with diagnostics

2.2.2.4.2.1.2 MA-INPSRC, Catalogue Input Component

a. Purpose. The purpose of the Catalogue Input Component (MA-INPSRC) is to read and scan a module to be analyzed, and to build Prologue Matrix and PDL Matrix Sets from prologue and PDL, respectively.

b. Functional Description. MARD, the driver module for the Catalogue Input Component, initializes all tables set by this component. The current module to be analyzed is read into core, becoming the Source Code Set. MASNPL is called to scan the prologue, creating the Prologue Matrix Set. If the option to create Test Specification charts is in effect, MAPLTP is called to scan the PDL, creating the PDL Matrix Set. Diagnostic information related to scanning is placed in the Diagnostic Message Set via calls to MAERR.

c. Input. The inputs to this component are:

- Module Prologue/PDL resident on a partitioned data set
- Keyword tables defining prologue and PDL keywords

d. Output. Output of the MA-INPSRC Component consists of the following:

- Source Code Set
- Prologue Matrix Set
- PDL Matrix Set
- Diagnostic Message Set

2.2.2.4.2.1.3 MA-CHECK, Analyze Input Component

a. Purpose. The purpose of the Analyze Input Component (MA-CHECK) is to analyze the input prologue for completeness and conformance to CFC standards.

b. Functional Description. MAANPL searches the Prologue Matrix Set for the proper organization of prologue keyword and text tokens.

Diagnostic information is placed in the Diagnostic Message set.

c. Input. Input to the MA-CHECK Component consists of the following:

- Prologue Matrix Set

d. Output. The output of the MA-CHECK Component consists of the following:

- Diagnostic Message Set

2.2.2.4.2.1.4 MA-RDT, Generate Reports Component

a. Purpose. The purpose of the Generate Reports Component (MA-RPT) is to write all reports other than the control card listing.

b. Functional Description. MARPT, the driver module of the MA-RPT Component calls MASORT to sort the Diagnostic Message Set. MALSC is called to write the Prologue/PDL listing with diagnostics, and if a Test Specification chart has been created, MALSC is called again to write the Test Specification chart.

c. Input. Input to the MA-RPT Component consists of the following:

- Source Code Set
- PDL Matrix Set
- Diagnostic Message Set

d. Output. Output of the MA-RPT Component consists of the following:

- Prologue/PDL listing with diagnostics
- Test Specification chart

The Visual Table of Contents for the MACA PDL/Prologue Analysis Component is shown in Figure 2.2.2-20.

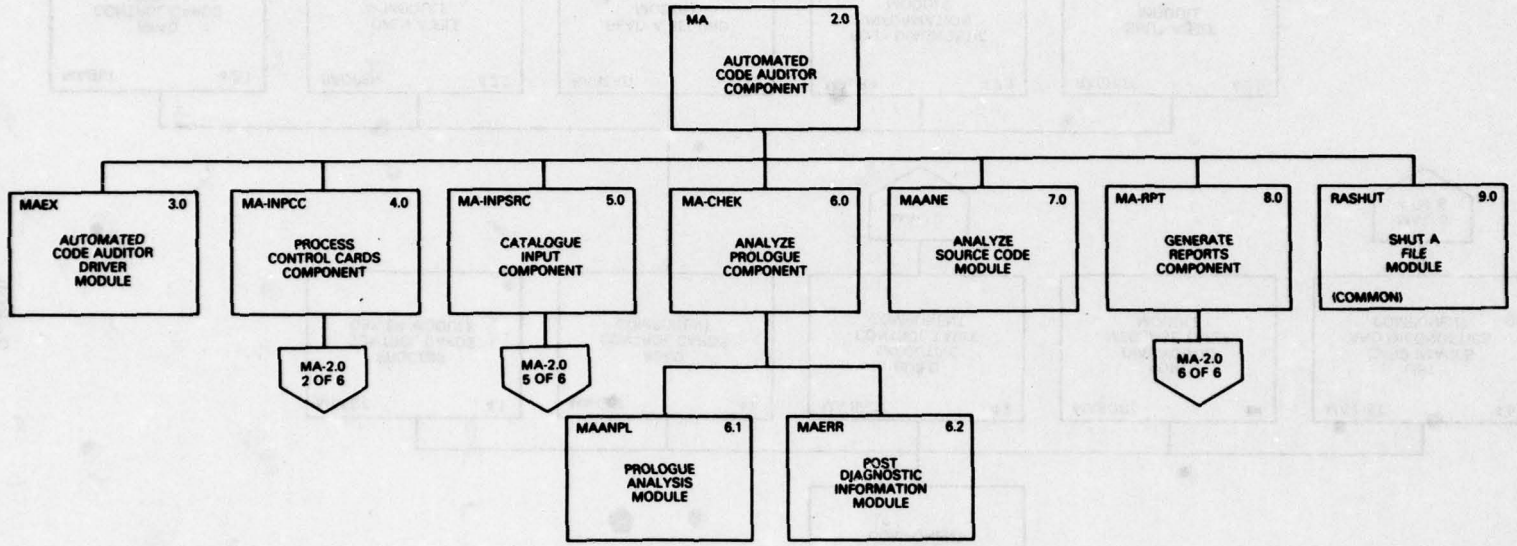


Figure 2.2.2-20. MA 2.0 Visual Table of Contents for the Automated Code Auditor (MA) (1 of 6)

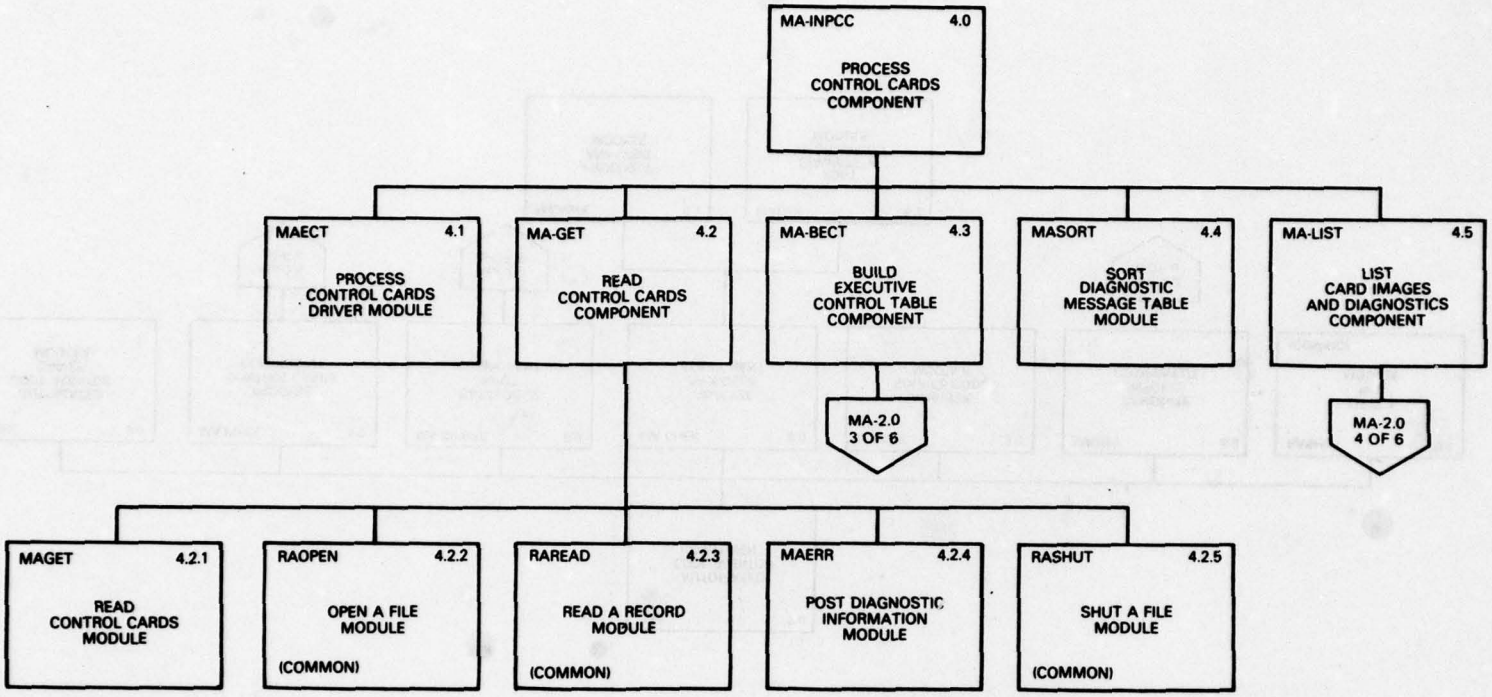


Figure 2.2.2-20. MA 2.0 Visual Table of Contents for the Automated Code Auditor (MA) (2 of 6)

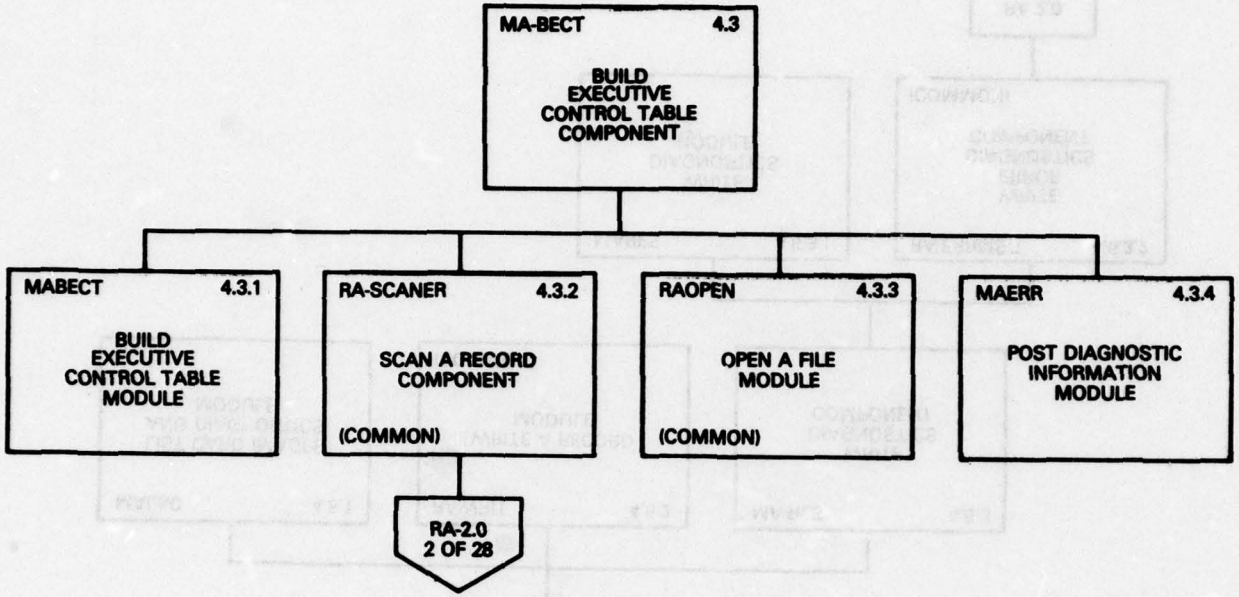


Figure 2.2.2-20. MA 2.0 Visual Table of Contents for the Automated Code Auditor (MA) (3 of 6)

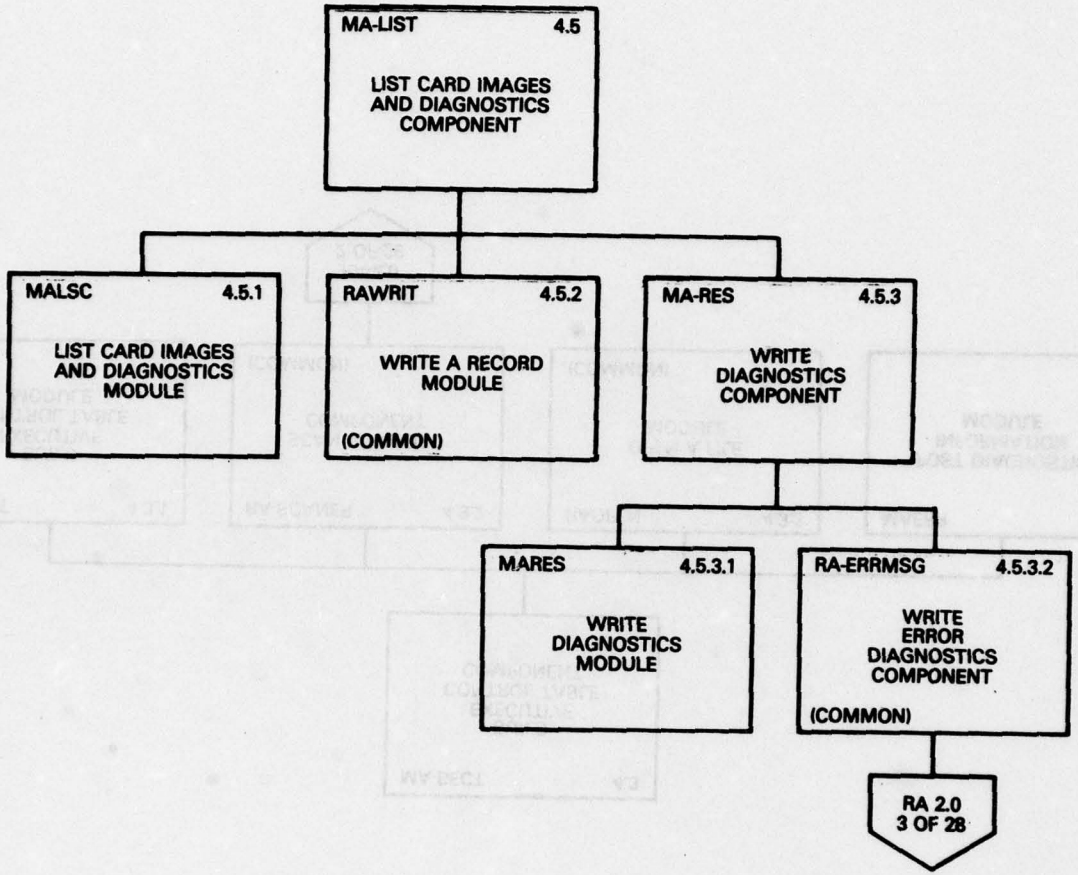


Figure 2.2.2-20. MA 2.0 Visual Table of Contents for the Automated Code Auditor (MA) (4 of 6)

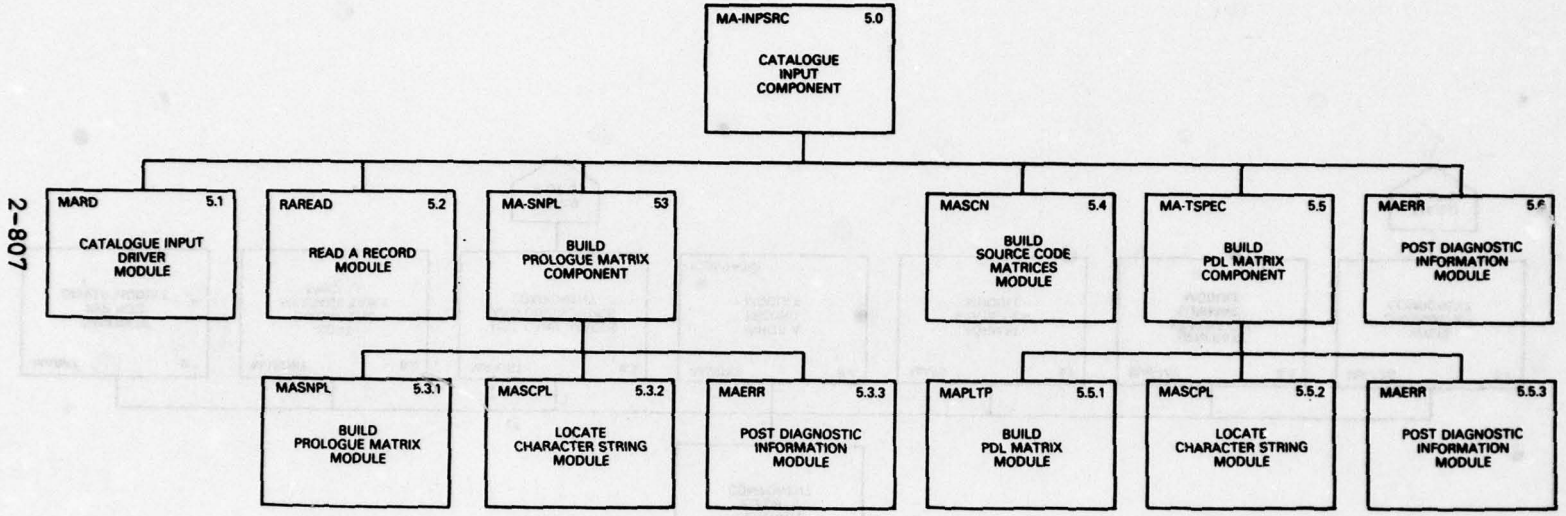


Figure 2.2.2-20. MA 2.0 Visual Table of Contents for the Automated Code Auditor (MA) (5 of 6)

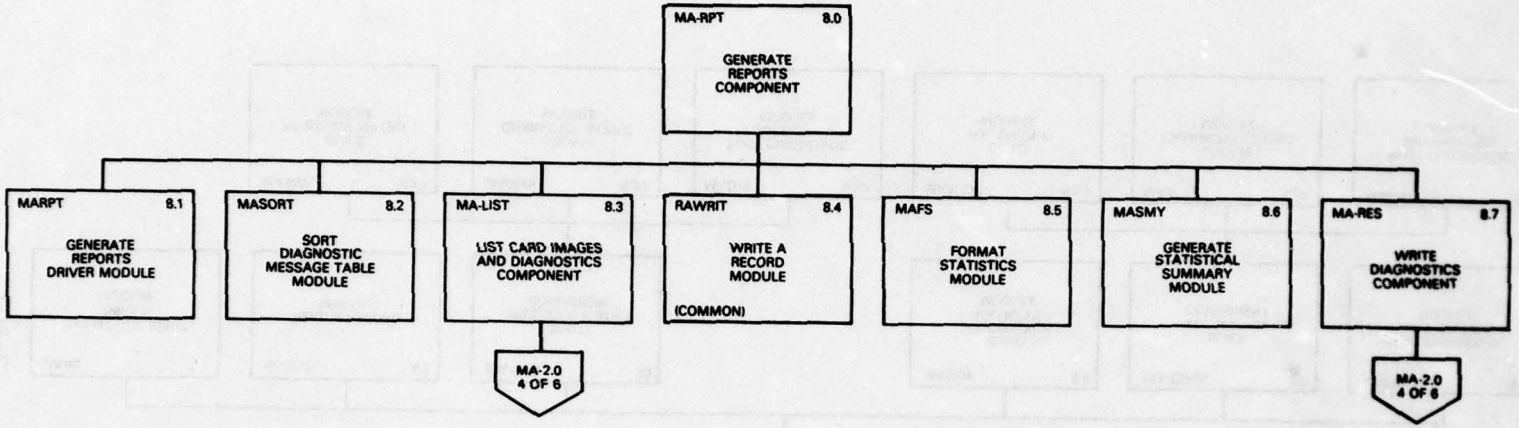


Figure 2.2.2-20. MA 2.0 Visual Table of Contents for the Automated Code Auditor (MA) (6 of 6)

2.2.2.4.2.1.5 Description Section for the Automated Code Auditor Component

2.0 The Automated Code Auditor analyzes module prologues and PDL,and creates Test Specification charts from PDL.

3.0 The Automated Code Auditor Driver Module (MAEX) is the driver module for the MA Component.

4.0 The Process Control Cards Component (MA-INPCC) opens all files, processes control cards, builds the Executive Control set defining modules to be analyzed, and writes the control card listing.

4.1 The Process Control Cards Driver Module (MAECT) is the driver for the MA-INPCC Component.

4.2 The Read Control Cards Component (MA-GET) opens all files and reads control cards into the Source Code Set.

4.2.1 The Read Control Cards Module (MAGET) is the driver module of the MA-GET Component.

4.2.2 The Open a File Module (RAOPEN) is used to open the control card input file.

4.2.3 The Read a Record Module (RAREAD) is used to read control cards into the Source Code Set.

4.2.4 The Post Diagnostic Information Module (MAERR) posts diagnostic information in the Diagnostic Message Set.

4.2.5 The Shut a File Module (RASHUT) is used to close the control card input file.

4.3 The Build Executive Control Table Component (MA-BECT) parses control cards, defining modules to be analyzed and their list options in the Executive Control Table, and opens all files other than the control card input file.

4.3.1 The Build Executive Control Table Module (MABECT) parses control cards and builds the Executive Control Set.

4.3.2 The Scan a Record Module (RA-SCANER) scans a control card record for keywords.

4.3.3 The Open a File Module (RAOPEN) is used to open all Code Auditor files other than the control card input file.

4.3.4 The Post Diagnostic Information Module (MAERR) posts diagnostic information in the Diagnostic Message Set.

4.4 The Sort Diagnostic Message Table Module (MASORT) sorts the Diagnostic Message Set by statement number, and by card column within statement number.

4.5 The List Card Images and Diagnostics Component (MA-LIST) lists card images and associated diagnostic messages.

4.5.1 The List Card Images and Diagnostics Module (MALSC) controls listing of card images from the Source Code

Set and diagnostic messages using information in the Diagnostic Message Set.

4.5.2 The Write a Record Module (RAWRIT) is used to write card images from the Source Code Set to the report file.

4.5.3 The Write Diagnostics Component (MA-RES) writes diagnostic messages using information in the Diagnostic Message Set.

4.5.3.1 The Write Diagnostics Module (MARES) calls the RA-ERRMSG Component to write a diagnostic message and interprets the code returned.

4.5.3.2 The Write Error Diagnostics Component (RA-ERRMSG) is used to write members of a diagnostic error message library to the report file.

5.0 The Catalogue Input Component (MA-INPSRC) reads a module into core, builds the Prologue Matrix Set by scanning the prologue for keywords and text, and builds the PDL Matrix Set after scanning the PDL.

5.1 The Catalogue Input Driver Module (MARD) initializes all tables set by this component, controls the process of reading a module to be analyzed into the Source Code Set, calls MASNPL to scan the prologue, conditionally calls MAPLTP to scan the PDL, and calls MAERR to post any diagnostic information.

5.2 The Read a Record Module (RAREAD) is used to read a module to be analyzed into the Source Code Set.

5.3 The Build Prologue Matrix Component (MA-SNPL) scans the prologue to be analyzed, creating the Prologue Matrix Set with tokens for keywords and text.

5.3.1 The Build Prologue Matrix Module (MASNPL) controls scanning of the prologue to be analyzed, building the Prologue Matrix Set with tokens of keywords and text.

5.3.2 The Locate Character String Module (MASCPL) scans a specified area of core, determining the beginning and length of character strings.

5.3.3 The Post Diagnostic Information Module (MAERR) posts diagnostic information in the Diagnostic Message Set.

5.4 The Build Source Code Matrices Module (MASCN) is a non-functional placeholder for potential future enhancements.

5.5 The Build PDL Matrix Component (MA-TSPEC) creates the PDL Matrix Set from PDL of a module to be analyzed.

5.5.1 The Build PDL Matrix Module (MAPLTP) controls scanning of the PDL for keywords, creating the PDL Matrix which defines a Test Specification chart.

5.5.2 The Locate Character String Module (MASCPL) scans a specified area of core, determining the beginning and length of character strings.

5.5.3 The Post Diagnostic Information Module (MAERR) posts diagnostic information in the Diagnostic Message Set.

5.6 The Post Diagnostic Information Module (MAERR) posts diagnostic information in the Diagnostic Message Set.

6.0 The Analyze Prologue Component (MA-CHEK) analyzes the prologue represented in the Prologue Matrix Set for completeness.

6.1 The Prologue Analysis Module (MAANPL) performs the analysis of the prologue represented by the Prologue Matrix Set.

6.2 The Post Diagnostic Information Module (MAERR) posts diagnostic information in the Diagnostic Message Set.

7.0 The Analyze Source Code Module (MAANE) is a non-functional place-holder for potential future enhancements.

8.0 The Generate Reports Component (MA-RPT) writes all reports except the control card listing.

8.1 The Generate Reports Driver Module (MARPT) is the driver for the Generate Reports Component.

8.2 The Sort Diagnostic Message Table Module (MASORT) sorts the Diagnostic Message Set by statement number, and by card column number within statement number.

8.3 The List Card Images Component (MA-LIST) controls the listing of card images in the Source Code Set, associated diagnostic messages, and the Test Specification charts.

8.4 The Write a Record Module (RAWRIT) is included to provide the capability to write reports from this module per future enhancements.

8.5 The Format Statistics Module (MAFS) is a non-functional placeholder for possible future enhancements.

8.6 The Generate Statistical Summary Module (MASMY) is a non-functional placeholder for possible future enhancements.

8.7 The Write Diagnostics Component (MA-RES) is used to write diagnostic error messages.

9.0 The Shut a File Module (RASHUT) is used to close all open files.

2.2.2.4.2.2 Data Item Dictionary Build (MA-DDB) Component

a. Purpose. The purpose of the Data Item Dictionary Build Component is to build a data item dictionary of all the COMPOOL items, printing exception reports for all the COMPOOL items locally defined and for all the COMPOOL items unreferenced in any modules. The dictionary indicates which COMPOOL items are referenced by a particular module and how they are used. Section 3.3 of this document was prepared through the use of the Management Aids Code Auditor (MACA) Data Item Dictionary Build capability. It can be used to update the SDD whenever changes are made to COMPOOL data or the modules that reference it.

b. Component Overview. To create the Data Item Dictionary, the user executes portions of JAVS which output a cross-reference of all symbols referenced within a given module. These symbols may be locally-defined or COMPOOL-defined. With this data set and the user-COMPOOL as inputs, the Data Item Dictionary Build program selects, sorts, and prints each module's references to the COMPOOL and indicates whether the symbol is set, used, or set and used by the module. Also printed are locally-defined COMPOOL items as well as unreferenced COMPOOL items.

c. Functional Description. These functions are provided by the following components.

1. The Format COMPOOL Component (MA-FMCM). This component reads the COMPOOL source and strips out all the item and table names and writes a record containing this information. This formatted COMPOOL file is sorted by item name in ascending order.

2. The Format JAVS Component (MA-FMJA). This component reads JAVS item/module cross-reference file and formats a record containing the item name, module name, set/used/both indicator for the item and an indicator telling whether the item is locally- or COMPOOL-defined.

3. The Scan JAVS COMPOOL Component (MA-SCDB). This component reads and scans the formatted JAVS and COMPOOL files and builds a cross-reference matrix for all the COMPOOL items, table by table. If at any time a new table is encountered or the matrix becomes full, MA-RPG Component is invoked to print the matrix. When COMPOOL items are locally defined or not referenced in any modules, the MA-DPRP Component is invoked to write an exception report.

4. The Write Matrix Component (MA-RPG). This component writes the COMPOOL item/module cross-reference matrix. The table name and all module names are written with the item name and the characters S, U or B for set, used or both are printed.

5. The Write Exception Report Component (MA-DPRP). This component writes the locally-defined COMPOOL item report and unreferenced COMPOOL item report with proper header information.

d. Input. The inputs to the Data Item Dictionary Build Component are:

- The output data set generated by the JAVS ASSIST System. This is a cross-reference of all items in all modules input to the JAVS System.
- The User COMPOOL Source data set.

e. Output. The outputs from the Data Item Dictionary Build Component are:

- Item/module cross-reference matrix report.
- Locally-defined COMPOOL item report.
- Unreferenced COMPOOL item report.

f. Interfaces. The Data Item Dictionary requires the cross-reference output of JAVS describing all symbols referenced within a module.

The Visual Table of Contents for the Data Dictionary Build component is shown in Figure 2.2.2-21.

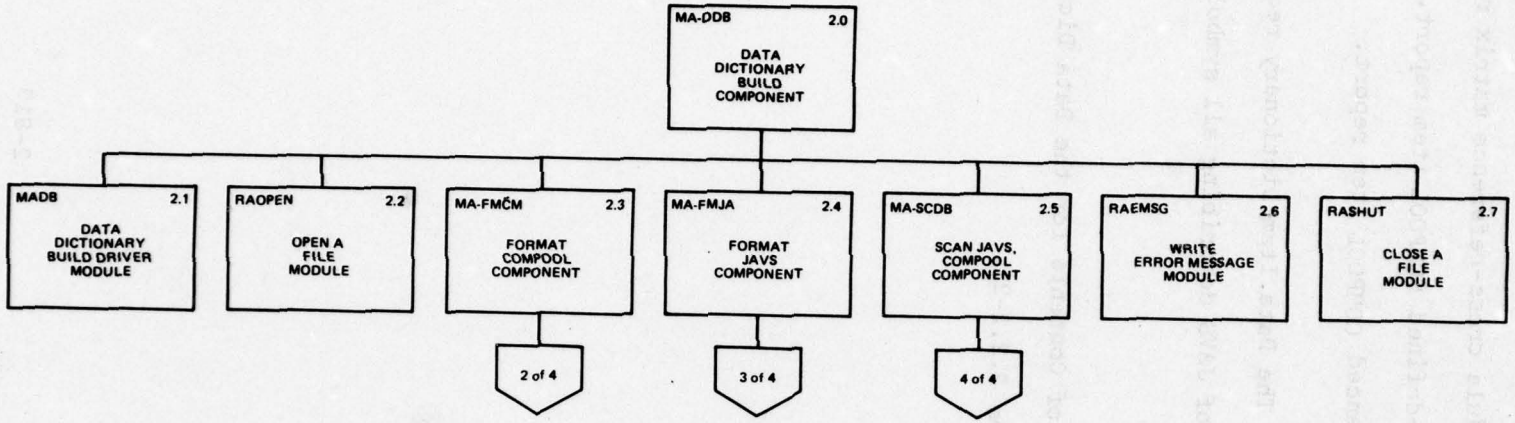


Figure 2.2.2-21. MA-DDB-2.0 Visual Table of Contents for the System Data Dictionary Build Component (1 of 4)

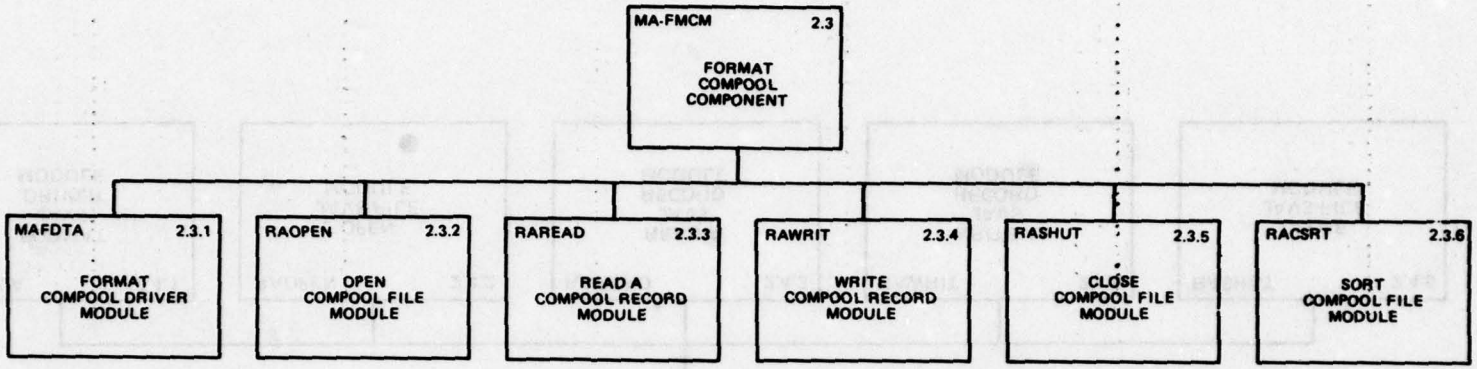


Figure 2.2.2-21. MA-DDB-2.0 Visual Table of Contents for the System Data Dictionary Build Component (2 of 4)

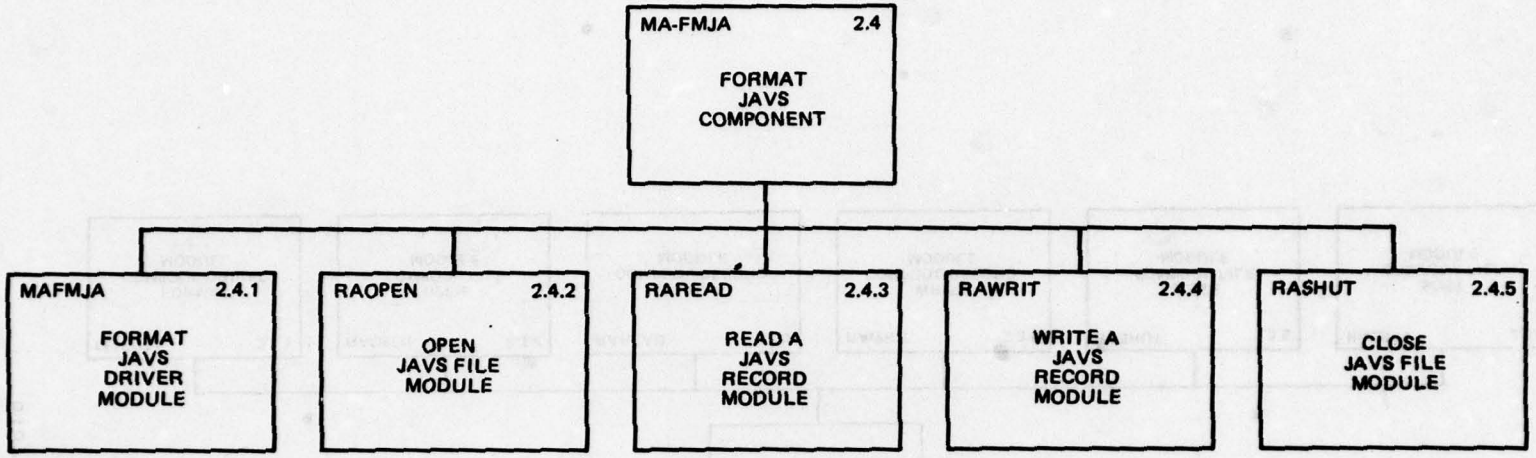


Figure 2.2.2-21. MA-DDB-2.0 Visual Table of Contents for the System Data Dictionary Build Component (3 of 4)

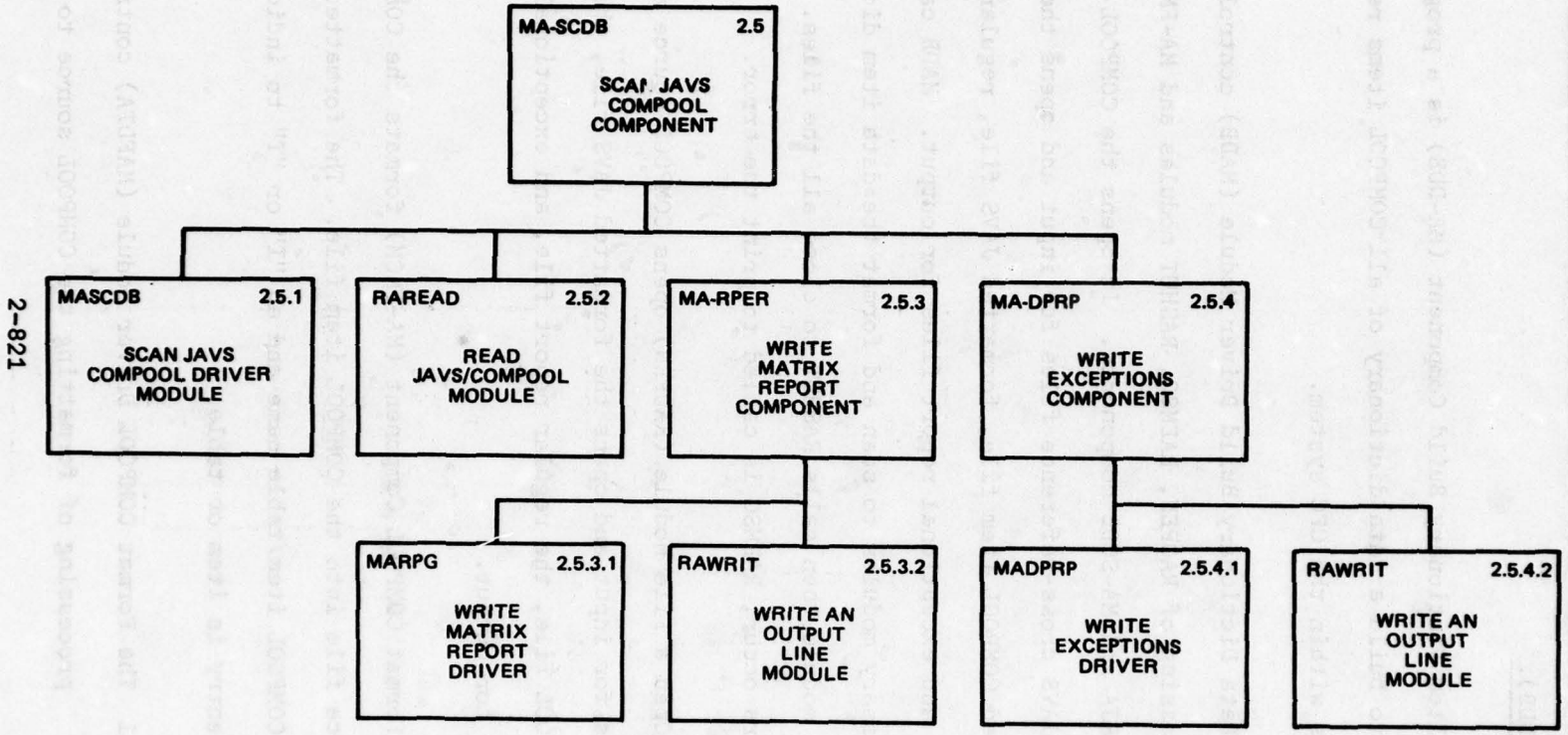


Figure 2.2.2-21. MA-DDB-2.0 Visual Table of Contents for the System Data Dictionary Build Component (4 of 4)

2.2.2.4.2.2.1 Description Section for the Data Item Dictionary Build Component (MA-DDB).

2.0 The Data Item Dictionary Build Component (MA-DDB) is a program designed to build a data dictionary of all COMPOOL items referenced by modules within the CFC system.

2.1 The Data Dictionary Build Driver Module (MADB) controls the processing of RAOPEN, RAEMSG, RASHUT modules and MA-FMCM, MA-FRJA and MA-SCDB components. It opens the COMPOOL source and JAVS cross-reference files for input and opens the formatted COMPOOL item file, formatted JAVS file, regular report file and exceptional report files for output. MADB calls the necessary modules to scan and format the data item dictionary. This module then calls RASHUT to close all the files. If any errors occur, RAEMSG is called to print the error.

2.2 The Open a File Module (RAOPEN) opens COMPOOL source and JAVS files for input and opens the formatted JAVS file, the formatted COMPOOL file, the regular report file, and exceptional report file for output.

2.3 The Format COMPOOL Component (MA-FMCM) formats the COMPOOL source file into the COMPOOL item file. The formatted file has COMPOOL item/table name and an "I" or "T" to indicate if the entry is item or table.

2.3.1 The Format COMPOOL Driver Module (MAFDTA) controls the processing of formatting the COMPOOL source to COMPOOL

item file. It calls RAREAD to read the COMPOOL source, calls RAWRIT to write the formatted COMPOOL record, calls RASHUT to close the formatted file, calls RACSRT to sort the formatted COMPOOL file and calls RAOPEN to open the sorted and formatted COMPOOL item file.

2.3.2 The Open COMPOOL File Module (RAOPEN) opens the sorted COMPOOL file for input.

2.3.3 The Read a COMPOOL Record Module (RAREAD) reads the COMPOOL source record.

2.3.4 The Write COMPOOL Record Module (RAWRIT) writes the formatted COMPOOL record.

2.3.5 The Close COMPOOL File Module (RASHUT) closes the formatted COMPOOL item file.

2.3.6 The Sort COMPOOL File Module (RACSRT) sorts the COMPOOL item file by item names in ascending order.

2.4 The Format JAVS Component (MA-FMJA) reads the JAVS item/module cross-reference report and creates the formatted JAVS file with the item name, module name, set/used/both indicator and defined indicators for the item in the module.

2.4.1 The Format JAVS Driver (MAFMJA) controls the formatting of the JAVS cross-reference file. It calls RAREAD to read the unformatted JAVS file, constructs the output

record, calls RAWRIT to write the record to the formatted JAVS file, calls RASHUT to close the formatted JAVS file and calls RAOPEN to open the formatted JAVS for input.

2.4.2 The Open JAVS File Module (RAOPEN) opens the formatted JAVS file for input.

2.4.3 The Read a JAVS Record Module (RAREAD) reads the unformatted JAVS record.

2.4.4 The Write a JAVS Record Module (RAWRIT) writes the formatted JAVS record.

2.4.5 The Close JAVS File Module (RASHUT) closes the formatted JAVS file.

2.5 The Scan JAVS COMPOOL Component (MA-SCDB) reads and scans the formatted JAVS files and invokes MA-RPG and MA-DPRP Components to write the reports.

2.5.1 The Scan JAVS COMPOOL Driver Module (MASCDB) controls the processing of scanning the formatted JAVS and COMPOOL item files and invoking MA-RPG and MA-DPRP Components to write the regular and exception reports.

2.5.2 The Read JAVS/COMPOOL Module (RAREAD) reads the formatted JAVS and COMPOOL records.

2.5.3 The Write Matrix Report Component (MA-RPG) writes the regular COMPOOL item/module cross-reference report by calling RAWRIT.

2.5.3.1 The Write Matrix Report Driver (MARPG) controls the printing of the cross-reference report.

2.5.3.2 The Write an Output Line Module (RAWRIT) writes the cross-reference report line.

2.5.4 The Write Exceptions Component (MA-DPRP) writes the locally-defined COMPOOL item report and unreferenced COMPOOL item report.

2.5.4.1 The Write Exceptions Driver Module (MADPRP) controls the processing of writing the exception report time by calling RAWRIT.

2.5.4.2 The Write Output Line Module (RAWRIT) writes the exception report line.

2.6 The Write Error Message Module (RAEMSG) writes an error message.

2.7 The Close a File Module (RASHUT) closes the COMPOOL source, JAVS and output report files.

2.2.2.4.3 Precedence Network (PN) Component

a. Purpose. The purpose of the Precedence Network (PN) Component is to generate scheduling information concerning activities necessary for the completion of a project so that management can monitor project progress, recognize otherwise unforeseen activity dependencies and allocate project resources in a manner optional for completing a project in the minimal time.

b. Component Overview. The PN Component reads and interprets user control cards. It then reads and edits the Precedence Network Definition Set and applies the Critical Path Method (CPM) Alogrithm to the network data in order to determine a basic activity schedule for the specified project. Up to nine reports, three of which are optional, are generated. These reports are identified in the Output paragraph of this section.

c. Functional Description. There are five major functional elements of the PN Component:

1. The Precedence Network Driver Function. The PN Component is entered through the Precedence Network Driver (PNMAIN) Module. The function of this module is to control the flow of the remaining components.

2. The Process Control Card Set Function. The Process Control Card Set (PN-CCARDS) Component reads and processes user control information. It also performs the date conversions necessary to transform calendar date control information into relative times necessary for network calculation.

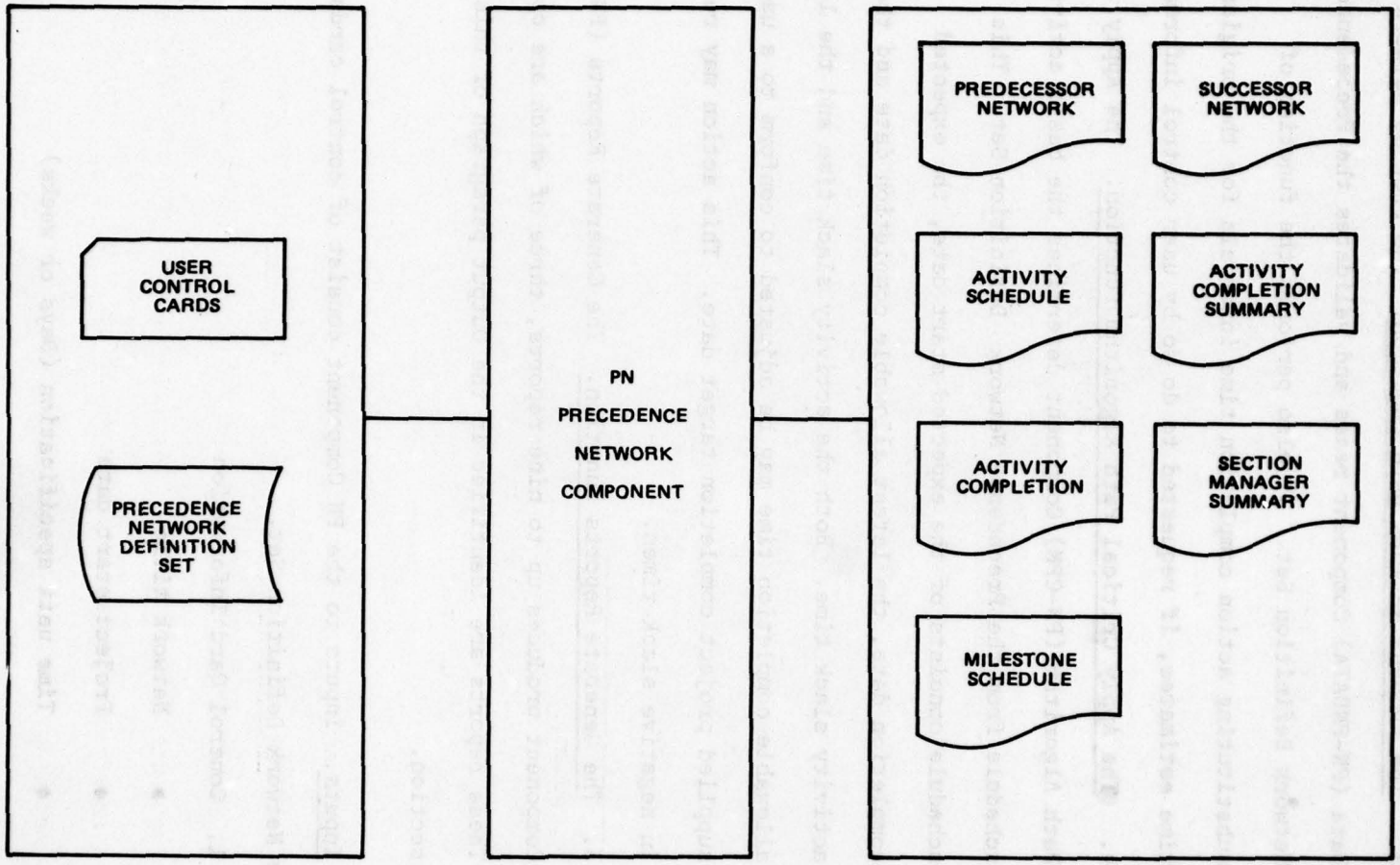


Figure 2.2.2-22. Precedence Network Component (PN) System Level Overview

3. The Process Network Data Function. The Process Network Data (PN-PNDATA) Component reads and validates the Precedence Network Definition Set. It also performs the function of substituting action completion time intervals for the origianl time estimates, if requested to do so by user control information.

4. The Apply Critical Path Algorithm Function. The Apply Critical Path Algorithm (PN-CPM) Component determines the basic activity schedule from the Precedence Network Definition Set. This schedule consists of the expected start date, the expected completion date, the latest allowable completion date and the activity slack time. Both the activity slack time and the latest allowable completion time may be adjusted to conform to a user supplied project completion target date. This action may result in negative slack times.

5. The Generate Reports Function. The Generate Reports (PN-RPT) Component produces up to nine reports, three of which are optional. These reports are identified in the Output paragraph of this section.

d. Inputs. Inputs to the PN Component consist of control cards and the Precedence Network Definition Set.

1. Control Card Information

- Network title
- Project start date
- Time unit specification (Days or weeks)
- Current date

- Expected project completion date
- Option to incorporate actual start/completion dates into the schedule calculation
- Option to produce Section Manager Summary
- Optional Section Manager Summary output control information
- Option to produce Activity Milestones
- Optional Activity Milestone output control information
- Option to plot Activity Completion Summary
- Optional Activity Completion Summary Control information

2. Precedence Network Definition Set

For each activity in the network:

- Activity identification number
- Activity name
- Responsible programmer/analyst
- Estimate of activity duration
- Scheduled activity start date (optional)
- Actual activity start date (optional)
- Actual activity completion date (optional)
- Enumeration of all predecessor activities

e. Output. Nine output reports are produced by the PN Component

1. Predecessor Network - A listing of the project network sorted in ascending order by activity ID. Each activity ID has an associated activity name, an estimate of the time required for

activity completion, an optional user - imposed start time and the activity ID's of the immediate predecessors of the current activity.

2. Successor Network - A listing of the project network sorted in ascending order by activity ID. Each activity ID has an associated activity name, an estimate of the time required for activity completion, an optional user - imposed start time and the activity ID's of the immediate successors of the current activity.

3. Activity Schedule (Relative Units) - A complete schedule of network activities sorted into ascending order by expected completion time. All dates are expressed in units (days or weeks) relative to the start date of the project. The following information is provided for each project activity:

- Activity name
- Activity ID
- Estimated time for activity completion
- Scheduled start time for the activity (in time units from project start date)
- Scheduled completion time for the activity (in time units from project start date)
- Latest completion time (in time units from project start date) that the activity can be completed without impacting the project completion date.
- Activity slack - the difference between the latest completion time and the scheduled completion time.

- Time to current date - the time interval between the scheduled completion time and the current date (date of report)

The activity Schedule (Relative Units) Report may be generated in one of two modes. Under the first mode the schedule is generated using only the estimates of activity duration. Under the second mode, actual activity start and completion times are factored into the schedule calculation. When the Activity Schedule has been executed in the first mode, the word "estimate" will appear in parentheses beneath the page title of each page in the report. If the report has been generated in the second mdoe, the word "actual" will appear in parentheses beneath the page title. It will also appear adjacent to the activity start and completion times for which actual data have been supplied.

4. Activity Schedule (Month - Day - Year) - This report is identical to the Activity Schedule (Relative Units) except the scheduled start time, the scheduled completion time and the latest completion time are expressed in month, day, year format rather than as relative displacements from the project start date.

5. Activity Completion Summary (Estimates) - This report displays in tabular form the frequency and cumulative frequency over user specified intervals of scheduled activity completions. The scheduled completions are determined only from estimates of activity duration. A separate tabulation is calculated for each of the ten activity types as determined from the right-most digit of the activity ID.

6. Activity Completion Summary (Actuals) - This report is identical to the Activity Completion Summary (Estimates) except the frequencies and cumulative frequencies are of actual activity completions.

7. Cumulative Activity Completion Plot - This comparison report consists of plots of cumulative frequencies of both scheduled completions based on estimates of activity durations and actual activity completions. Both plot types are super-imposed on the same output page. One activity type, based on the right-most digit of the activity ID, is plotted per page.

8. Section Manager Summary - The Section Manager Summary is a special purpose report for tracking module development which displays, in ascending order of module number, three user-specified activity types in tabular form, providing start and completion times based on estimates and actuals for each of the three module activities. Associated with each module is module name, module number, responsible programmer/analyst, and activity schedule information. Pagination for this report is user defined.

9. Milestone Schedule - This report presents graphical representations of the milestones associated with every activity of the project. Each page represents 36 activities over an interval of 98 days is allocated as many pages as necessary to represent the interval. Activities appear in ascending order by scheduled completion dates. The milestones are generated from the initial application of the Critical Path Method (CPM) Algorithm. Symbols representing activity milestone events are as follows:

- S - Scheduled start time
- + - One day of scheduled activity
- E - Scheduled completion time
- -(Hyphen) - One day of slack time
- L - Latest completion time

2.2.2.4.3.1 Major Components

The Precedence Network (PN) Component consists of four major components.

- Process Control Card Set (PN-CCARDS) Component
- Process Network Data (PN-PNDATA) Component
- Apply Critical Path Algorithm (PN-CPM) Component
- Generate Reports (PN-RPT) Component

2.2.2.4.3.1.1 Process Control Card Set (PN-CCARDS) Component

a. Purpose. The purpose of this component is to read and process user control information.

b. Functional Description. This component reads and interprets user information from the network control card. It then converts all user specified dates from month-day-year format into time units relative to the project start date.

c. Input. The input to this component is the user control card information described in Item d of Section 2.2.2.4.3.

d. Output. The output of this component is an internal table containing encoded user control information.

2.2.2.4.3.1.2 Process Network Data (PN-PNDATA) Component

a. Purpose. The purpose of this component is to read and validate the Precedence Network Definition Set.

b. Functional Description. This component reads the Precedence

Network Definition Set. It then verifies that each predecessor activity is a valid activity of the network. If the encoded user control information specifies that actual start and completion dates are to be used in the calculations, then these dates, if present for an activity, are used to calculate the actual duration of the activity. These calculated quantities are then substituted internally for the network estimates. Verification is also made that these actual dates are consistent with the network definition, i.e., that an activity start date does not occur earlier than the completion date of a specified predecessor activity.

c. Input. The inputs to this component are the encoded user control information generated by the Process Control Card Set (PN-CCARDS) Component and the Precedence Network Definition Set described in Item d of Section 2.2.2.4.3.

2.2.2.4.3.1.3 Apply Critical Path Algorithm (PN-CPM) Component

a. Purpose. The purpose of this component is to produce, via the Critical Path Method (CPM) Algorithm, a complete project schedule based upon the Precedence Network Definition Set.

b. Functional Description. The Critical Path Method (CPM) Algorithm is applied to the validated Precedence Network Definition Set to produce, for each activity, the expected start date, the expected completion date, the latest allowable completion date and the slack time (defined as the difference between the latest allowable completion time and the expected completion time). If the encoded user control information so specifies, the latest allowable completion time and the activity slack time are adjusted to conform to an expected project completion date. This action may result in negative slack times.

c. Input. The inputs to this component are the encoded user control information generated by the Process Control Card Set (PN-CCARDS) Component and the validated Precedence Network Definition Set generated by the Process Network Data (PN-PNDATA) Component.

d. Output. The output of this component is the project activity schedule resulting from the application of the CPM Algorithm to the validated Precedence Network Definition Set.

2.2.2.4.3.1.4 Generate Reports (PN-RPT) Component

a. Purpose. The purpose of this component is to produce a series of management reports from information extracted from both the validated Precedence Network Definition Set and the calculated project activity schedule.

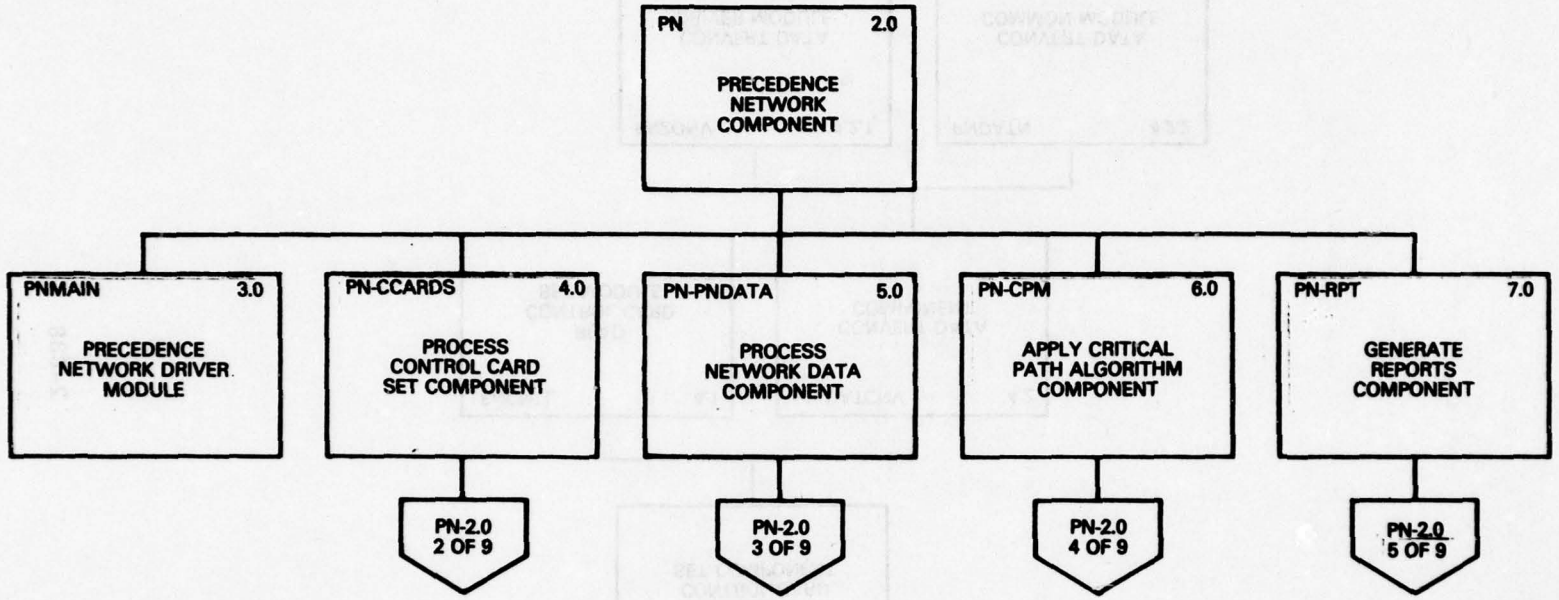
b. Functional Description. Based upon user control information, this component makes multiple passes through both the validated Precedence Network Definition Set and the calculated project activity schedule, to produce up to nine management reports as described in Item e of Section 2.2.2.4.3.

c. Input. The inputs to this component are the encoded user control information generated by the Process Control Card Set (PN-CCARDS) Component, the validated Precedence Network Definition Set generated by the Process Network Data (PN-PNDATA) Component, and the project activity schedule generated by the Apply Critical Path Algorithm (PN-CPM) Component.

d. Output. The output of this component is a series of up to nine management reports.

- Predecessor Network
- Successor Network
- Activity Schedule (Relative Units)
- Activity Schedule (Month-day-year)
- Activity Completion Summary (Estimates)
- Activity Completion Summary (Actuals)
- Cumulative Activity Completion Plot
- Section Manager Summary
- Milestone Schedule

These reports are described in Item e of Section 2.2.2.4.3.



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Figure 2.2.2-23. PN-2.0 Visual Table of Contents for the PN Component (1 of 9)

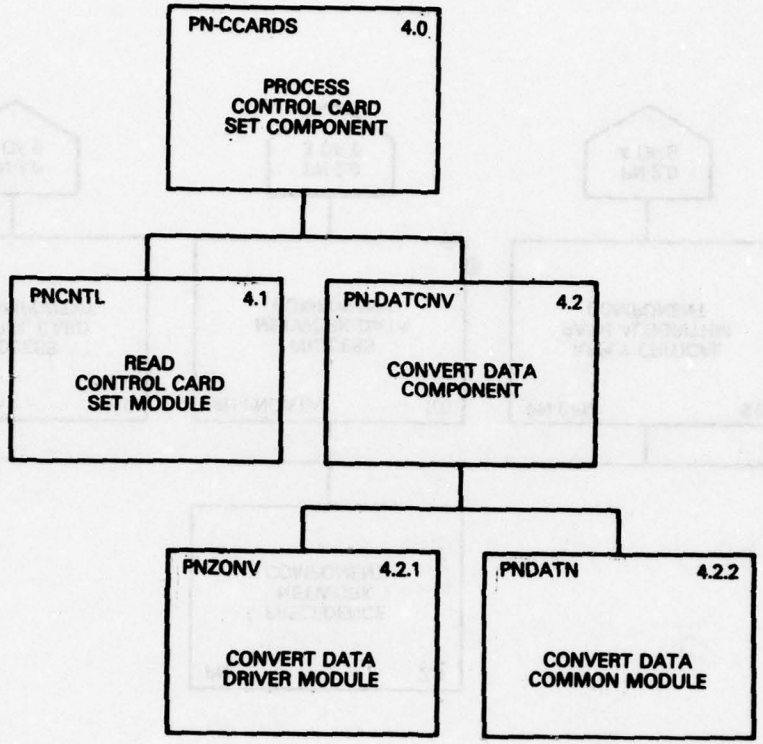


Figure 2.2.2-23. PN-2.0 Visual Table of Contents for the PN Component (2 of 9)

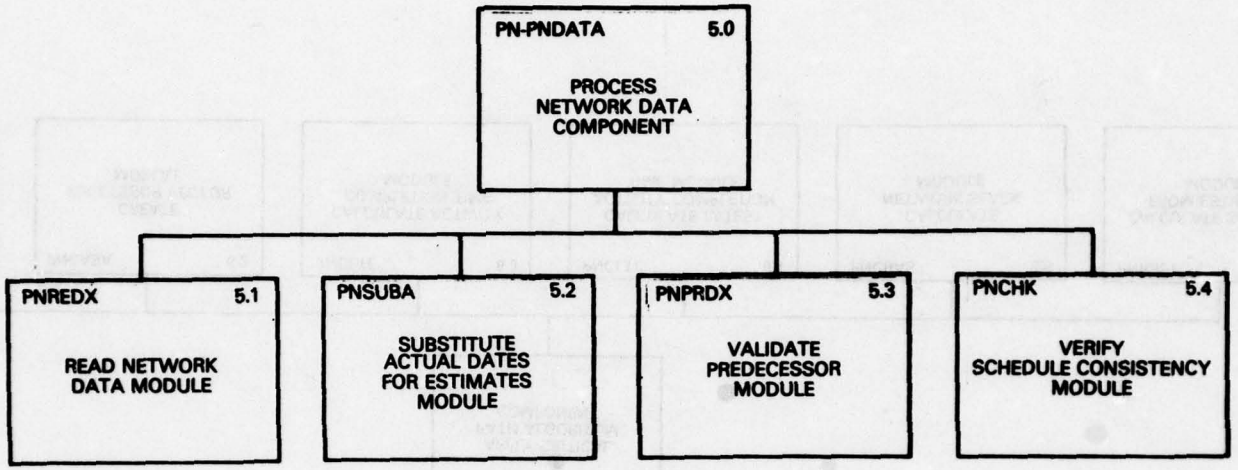


Figure 2.2.2-23. PN-2.0 Visual Table of Contents for the PN Component (3 of 9)

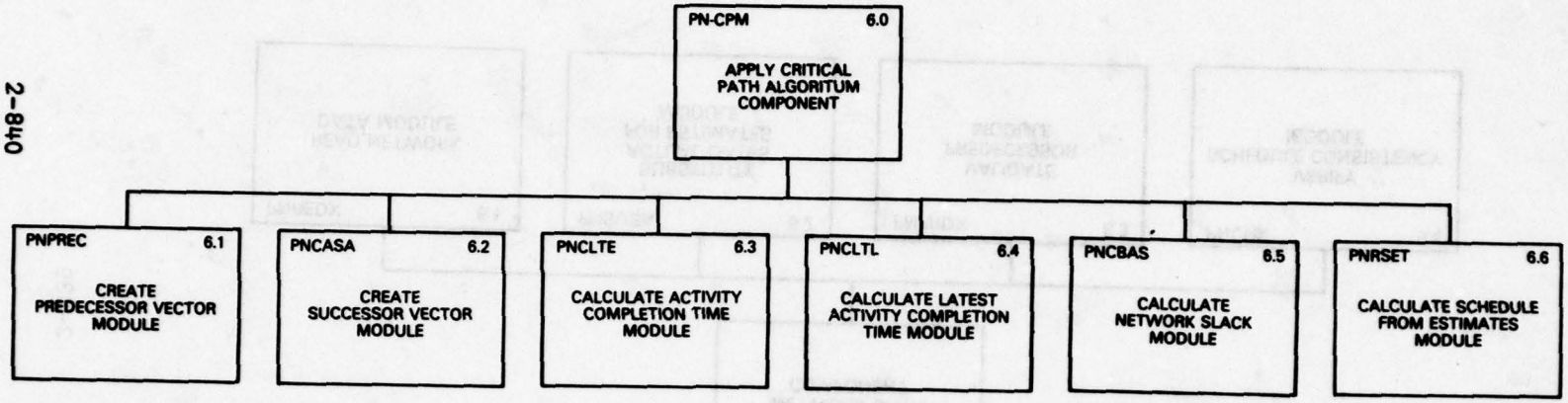


Figure 2.2.2-23. PN-2.0 Visual Table of Contents for the PN Component (4 of 9)

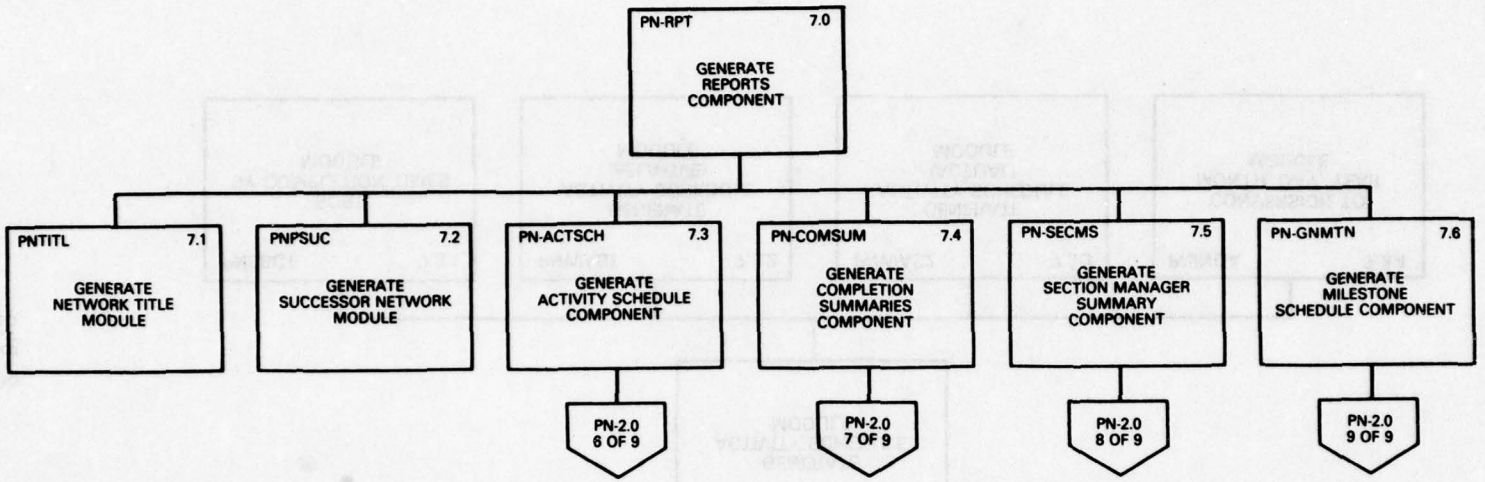


Figure 2.2.2-23. PN-2.0 Visual Table of Contents for the PN Component (5 of 9)

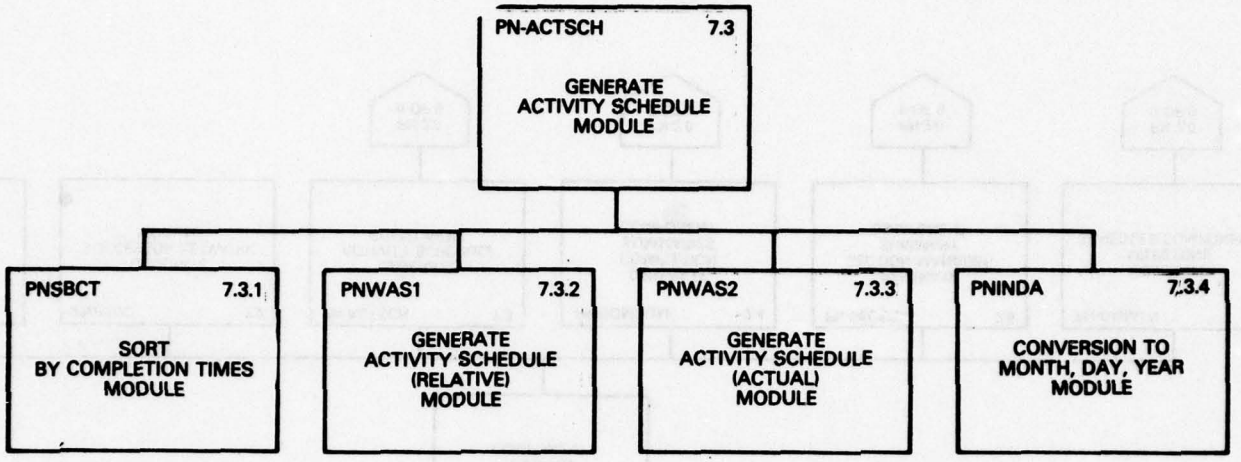


Figure 2.2.2-23. PN-2.0 Visual Table of Contents for the PN Component (6 of 9)

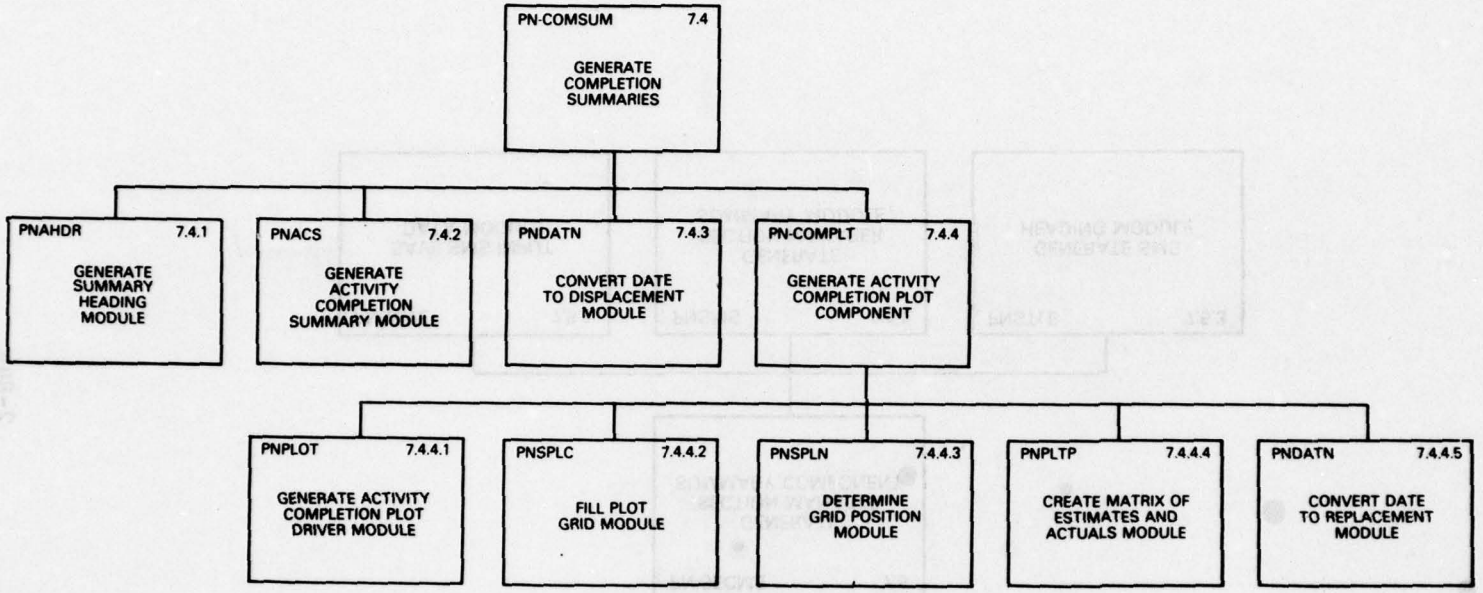


Figure 2.2.2-23. PN-2.0 Visual Table of Contents for the PN Component (7 of 9)

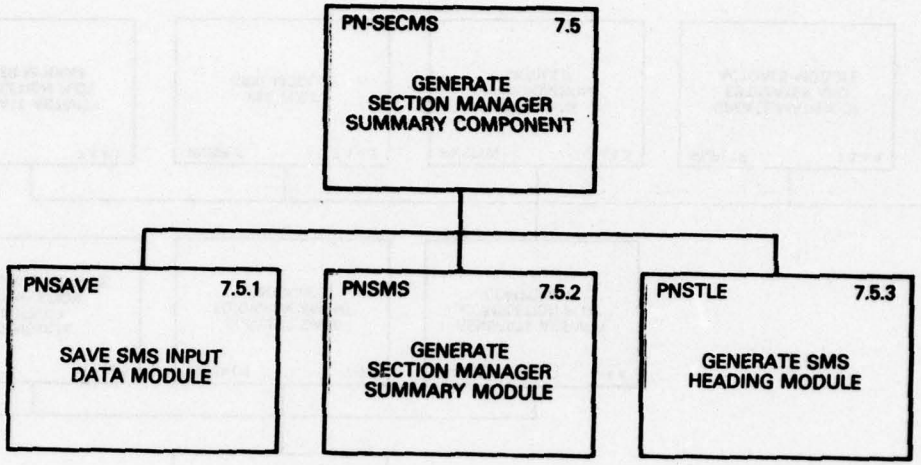


Figure 2.2.2-23. PN-2.0 Visual Table of Contents for the PN Component (8 of 9)

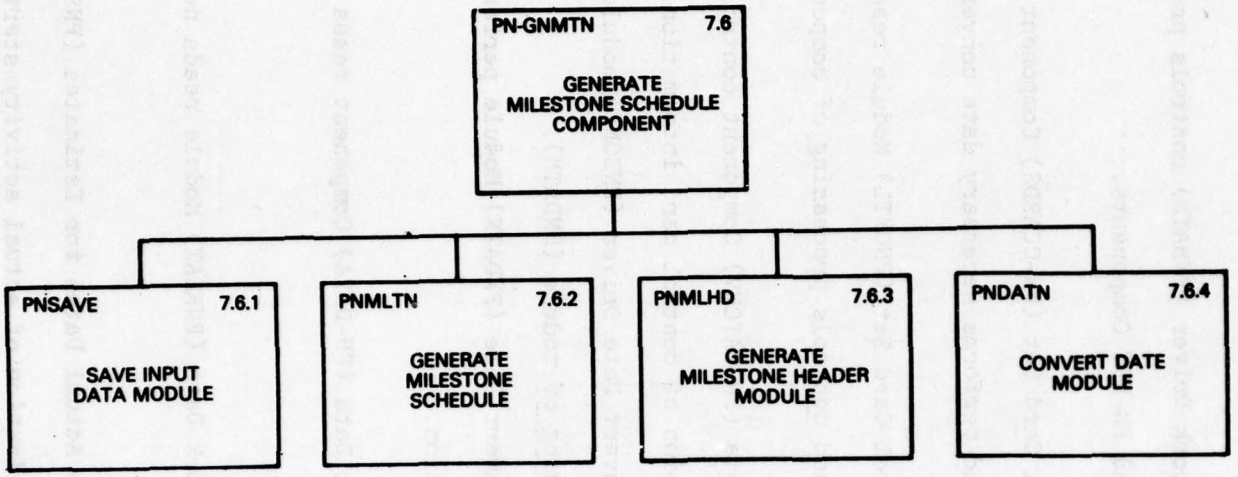


Figure 2.2.2-23. PN-2.0 Visual Table of Contents for the PN Component (9 of 9)

2.2.2.4.3.1.5 Description Section for Precedence Network (PN) Component.

2.0 The Precedence Network System (PN) provides the capability to generate scheduling information based upon a critical path analysis.

3.0 The Precedence Network Driver (PNMAIN) controls processing of PN-CCARDS, PN-DATA, PN-CPM, and PN-RPT Components.

4.0 The Process Control Card Set (PN-CCARDS) Component processes control card information and performs necessary date conversions.

4.1 The Read Control Card Set (PNCNTL) Module reads the network control card and controls processing of component PN-DATCNV.

4.2 The Convert Data (PN-DATCNV) Component controls required date format conversion of control card information.

4.2.1 The Convert Date Driver (PNZONV) module controls processing of module (PNDATN).

4.2.2 The Convert Date (PNDATN) Module performs date format conversion.

5.0 The Process Network Data (PN-DATA) Component reads and validates network input data.

5.1 The Read Network Data (PNREAX) Module reads network defining input data.

5.2 The Substitute Actual Dates for Estimates (PNSUBA) Module performs substitution of actual activity start and completion dates for estimates in input network.

5.3 The Validate Predecessor (PNPRDX) Module verifies that each predecessor activity is a legitimate network activity.

5.4 The Verify Schedule Consistency (PNCHK) Module validates the consistency of actual completion times and start times of every activity and its predecessors.

6.0 The Apply Critical Path Algorithm (PN-CPM) Component creates predecessor vectors, successor vectors, determines activity completion times, latest completion times, and activity slack.

6.1 The Create Predecessor Vector (PNPREC) Module creates vectors representing activity predecessor structure.

6.2 The Create Successor Vector (PNCASA) Module creates vectors representing activity successor structure.

6.3 The Calculate Activity Completion Time (PNCLTE) Module determines the completion time (TE) for each activity.

6.4 The Calculate Latest Activity Completion Time (PNCLTL) Module determines the latest completion time (TL) for each activity.

6.5 The Calculate Network Slack (PNCBAS) Module determines the slack time for each activity.

6.6 The Calculate Schedule from Estimates (PNRSET) Module determines the schedule from estimates after actual dates have been enforced.

7.0 The Generate Reports (PN-RPT) Component generates the network title, succession network, activity schedules, completion summaries, section manager summary and milestones.

7.1 The Generate Network Title (PNTITL) Module produces the network title.

7.2 The Generate Successor Network (PNPSUC) Module produces the successor network report.

7.3 The Generate Activity Schedule (PN-ACTSCH) Component produces the activity schedule report.

7.3.1 The Sort by Completion Times (PNSBCT) Module sorts activities in ascending order by completion times.

7.3.2 Generate Activity Schedule (relative) (PNWAS1) Module produces the activity schedule (relative) report.

7.3.3 Generate Activity Schedule (actual) (PNWAS2) Module produces the activity schedule (actual) report.

7.3.4 The Conversion to Month, Day, Year (PNINDA) Module converts dates from displacement form to month, day, year format.

7.4 The Generate Completion Summaries (PN-COMSUM) Component produces the activity completion summary (estimates), activity completion summary (actual) and cumulative activity completion plots.

7.4.1 The Heading Summary Generation (PNAHDR) Module produces activity completion summary heading.

7.4.2 The Generate Activity Completion Summary (PNACS) Module produces the activity completion summary report.

7.4.3 The DAte Conversion to Displacement (PNDATN) Module converts dates from month, day, year format to displacement format.

7.4.4 The Generate Activity Completion Plot (PN-COMPLT) Component produces the cumulative activity completion plots.

7.4.4.1 The Generate Activity Completion Plot Driver (PNPLOT) Module controls processing of the PN-COMPLT Component.

7.4.4.2 The Fill Plot Grid (PNSPLC) Module inserts appropriate plot characters in the plot grid.

7.4.4.3 The Determine Grid Position (PNSPLN) Module determines where in the plot grid the plotting characters are to be inserted.

7.4.4.4 The Create Matrix of Estimate and Actuals (PNPLTP) Module determines the frequency and cumulative frequency of completed activities and places these values in the plot matrix.

7.4.4.5 The Date Conversion to Displacement (PNDATN) Module converts data from month, day, year format to displacement format.

7.5 The Generate Section Manager Summary (PN-SECMS) Component produces the Section Manager Summaries

7.5.1 The Save Input Data (PNSAVE) Module creates a temporary data set for input to PNSMS.

7.5.2 The Generate Section Manager (PNSMS) Module generates the Section Manager Summary from the data supplied by PNSAVE.

7.5.3 The Generate SMS Heading (PNSTLE) Module produces the Section Manager Summary heading on each page of the report.

7.6 The Generate Milestone Schedule (PN-SNMTN) Component produces the Milestone Schedule.

7.6.1 The Save Input Data (PNSAVE) Module creates a temporary data set for input to PNMLTN.

7.6.2 The Generate Milestone Schedule (PNMLTN) Module generates the Milestone Schedule from data provided by module PNSAVE.

7.6.3 The Generate Milestone Header (PNMLHD) Module produces the header for the Milestone Schedule.

7.6.4 The Date Conversion to Displacement (PNDATN) Module converts dates from month, day, year format to displacement format.

SECTION 3 - SYSTEM DATA

3.1 INTRODUCTION

Section 3 describes data that is non-local, i.e., data that is used by more than one module. (The module prologues contain descriptions of data local to a module). Section 3.2 presents an overview of the CFC Data Base; Section 3.3 illustrates the hierarchy of the system data; Section 3.4 describes the COMPOOL and its description of system data, and Section 3.5 describes the data-item dictionary cross-reference.

3.2 CFC DATA BASE OVERVIEW

The CFC Data Base is comprised of 32 sets of data, 30 of which are termed Table Sets and 2 of which are termed Flight Record Sets. The data base is categorized into a hierarchy of sets consisting of the OAG Data Base Set, the NON-OAG Data Base Set, and the General Table Set. The OAG and NON-OAG Data Base Sets consist of their respective Flight Record Set plus the associated Table Sets used for flight record access. These flight record access related tables are termed Index Table Sets. The remainder of the Table Sets, i.e.,those not related to flight record access, are called the General Table Set and for the most part are unrelated to flight record access. Section 3.2.1 and 3.2.2 present a generalized discussion on the OAG Data Base Set and the NON-OAG Data Base Set respectively. (Flight record update/retrieval is discussed in detail within Section 2.2.1.3). Section 3.2.3 presents an overview of CFC Data Base Table Sets.

3.2.1 OAG Data Base Set

The OAG Data Base Set is comprised of six interrelated sets used for update and retrieval of OAG flight records. OAG flight records are those flight plans derived from the OAG Tape of scheduled flights or from online update by the CFC Command Center or the NAS ARTCC's. All OAG Data Base flight plans must have an ACID identifying a valid airline operator whose operational category is either Air Commuter (Air Taxi) or Air Carrier. Operational requirements dictate the necessity for two general methods of flight record access: 1) Access by ACID or airline operator,and 2) by Arrival/Departure terminal pair. Figure 3.1.1-1 illustrates the intertable relationships for flight record access by method 1. The Airline Operator Table Set is used to validate the airline operator associated with an ACID and to provide an airline operator internal code and index pointer into the Flight Accession Table Set (FATS). Therefore, a one-to-one correspondence between Airline Operator Table data records and Flight Accession Table data records must exist. Each Flight Accession Table data record contains a Flight Accession Repeating Group, of which each entry represents a range of flight records. Each range contains a pointer to a corresponding Flight Index Table (FITS) data record. The Flight Index Table data record contains the pointers to all flight records associated with that range of flight records identified in the Flight Accession Table data record. To illustrate flight plan retrieval, we refer to Figure 3.1.1.1 and use Delta flight 300 (DL300) as an example. We find DL to be a valid airline operator whose internal code is 25. We specify the internal code for DL (25) and the desired ACID (DL300) for retrieval using the

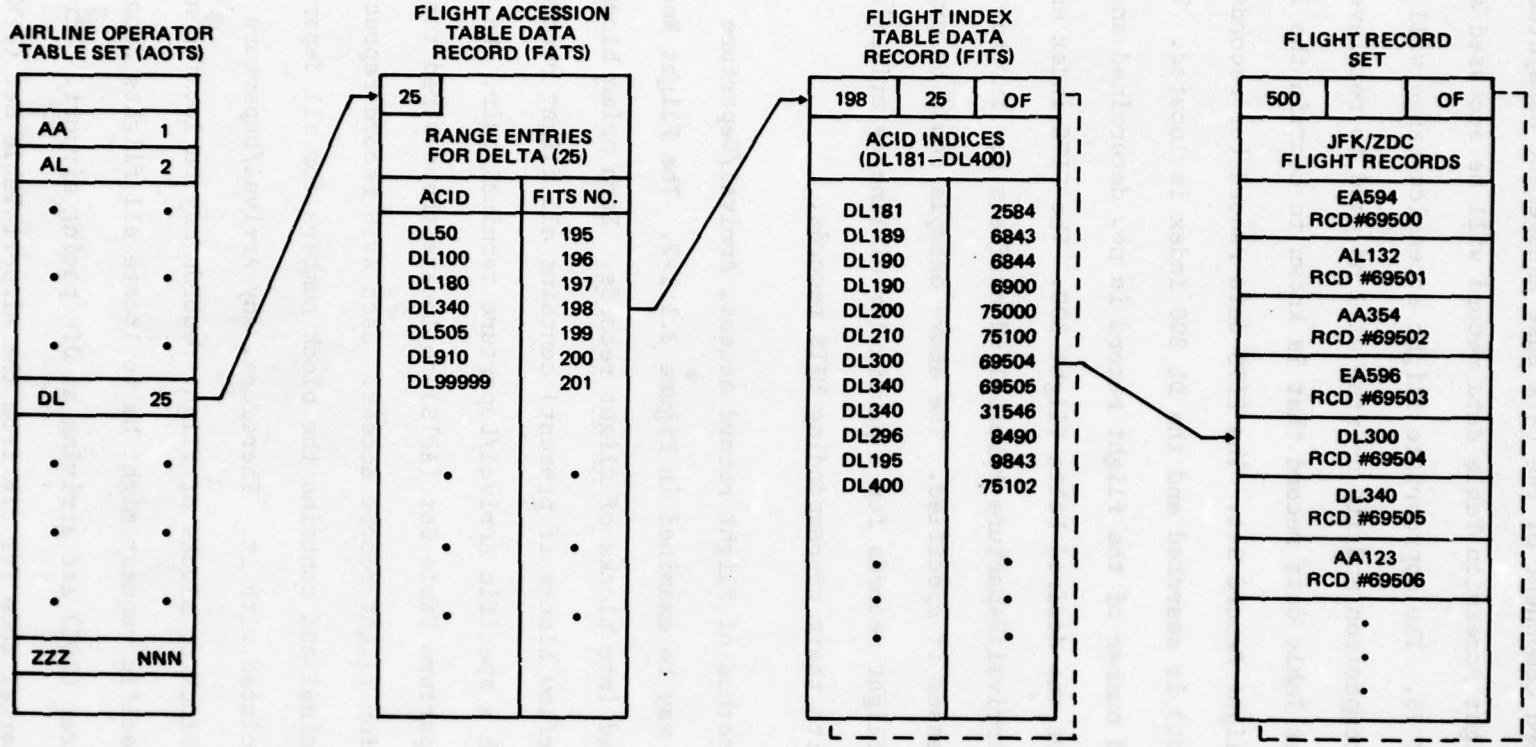


Figure 3.1.1-1. Flight Record Retrieval by ACID

Get Flight Record Component of the Data Base Management Subsystem. The correct Flight Accession Table data record will be accessed as relative record 25. The appropriate flight accession range will be determined by comparison and its pointer will be used to retrieve the Flight Index Table data record that is known to contain the index into the OAG Flight Record Set. The FITS data record (or records if overflow present) is searched and the DL 300 index is located. The relative record number of the flight record is now determined and used to retrieve the desired Delta flight 300. The FITS index entry also contains Arrival/Departure terminal identifiers for further filtering processes if specified. The above example could be expanded to access all flight records for a particular airline by utilizing all FATS entries with their corresponding FITS records.

The alternate method of flight record access, Arrival/Departure terminal pair, may be examined in Figure 3.1.1-2. The Flight Record Set is organized into blocks of flight records. Each prime block (and associated overflow blocks if present) contains all flight records associated with a specific Arrival/Departure terminal pair. We utilize the Arrival/Departure Table Set (ADTS) to locate the desired terminal pair or pairs for flight record access. Each ADTS record represents an arrival terminal and contains the block numbers for all departure terminals associated with it. Therefore, any Arrival/Departure terminal pair block or blocks of flight records may be located as desired. A specific request might be to locate all flights departing Washington Center (ZDC) and arriving at JFK pacing airport. First we derive the internal code for JFK from the Airport Table Set (JFK=7);

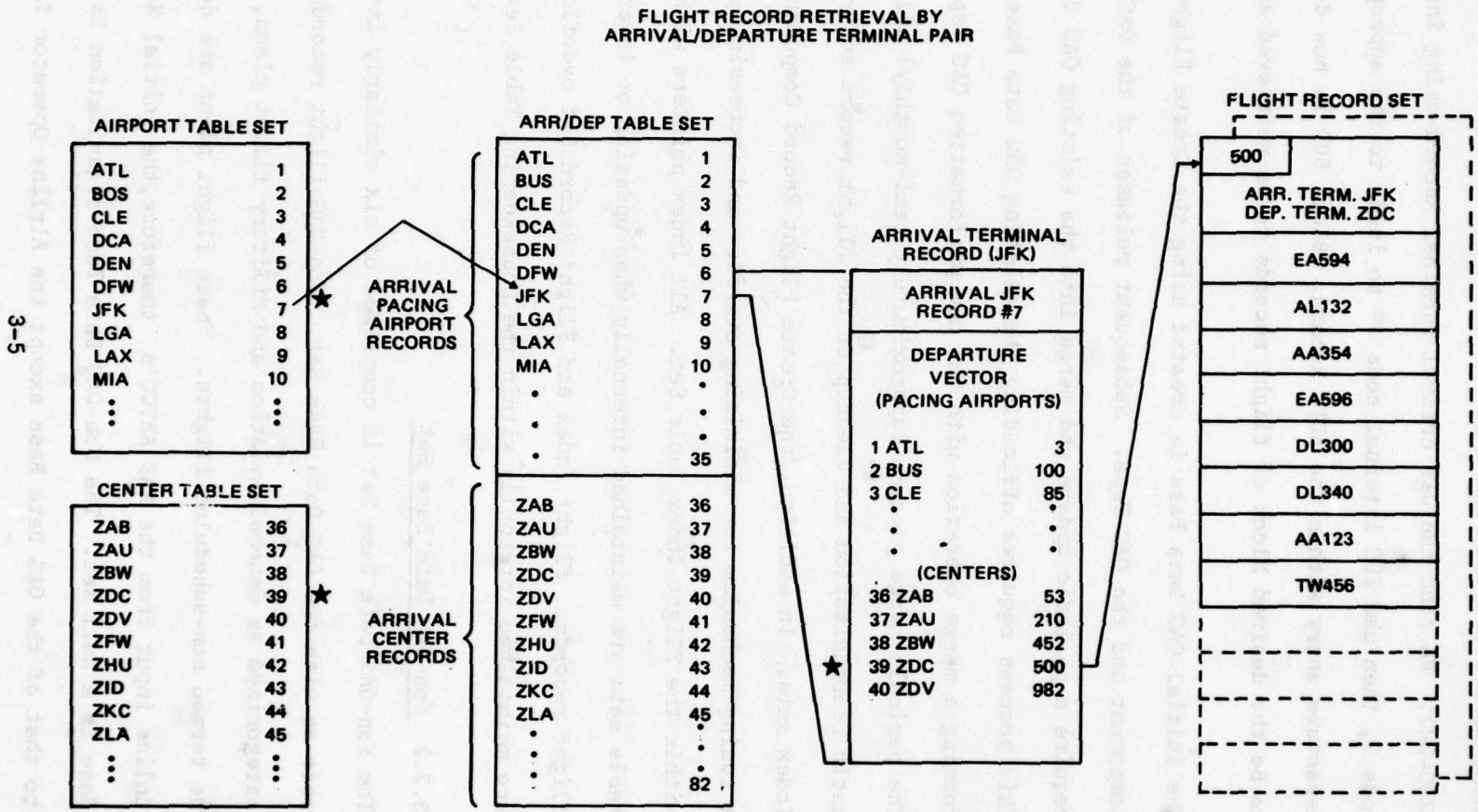


Figure 3.1.1-2. Flight Record Retrieval by Arrival/Departure Terminal Pair

then, derive the internal code for ZDC from the Center Table Set (ZDC=39). We find the JFK Arrival Terminal Record using internal code 7, then use ZDC internal code 39 to index to the appropriate departure entry within the ADTS Record. Block 500 is now determined to be the desired block of flight records to be retrieved and processed.

The initial OAG Data Base is created using the Create Flight Record Component and the OAG Tape. Subsequent releases of the OAG Tape require a periodic update and merge into the existing OAG Data Base. This process requires offloading the existing OAG Data Base and performing a merge operation with the new preformatted OAG Tape data. The periodic merge process (approximately semi-monthly) allows automatic reorganization and cleanup of the flight record and related index sets. In addition, the Create Flight Record Component provides a tuning mechanism for minimizing overflow and increasing performance within the Flight Index Table Set. All index pointers within the table sets are maintained internally when updating or inserting flight records. Flight Index and Flight Record Set overflow blocks are maintained internally within the Housekeeping Table Set (not shown).

3.2.2 Non-OAG Data Base Set

The Non-OAG Data Base Set is comprised of six similarly interrelated sets as with the OAG Data Base Set. Non-OAG flight records are generally categorized as General Aviation and Military flight plans, or what may be termed non-scheduled flights. These flight plans are derived from online input from the NAS ARTCC's therefore,the initial Non-OAG Data Base is a null set. The Non-OAG Data Base organization is very similar to that of the OAG Data Base except the Airline Operator Table Set is

replaced with the Non-OAG Name Table Set. The Non-OAG Name Table Set, unlike the Airline Operator Table Set, consists of the first character of allowable Non-OAG aircraft ID's. The first character of the ACID determines the appropriate FATS record and the logic continues in exactly the same manner as the OAG Data Base. The Non-OAG Data Base will grow with the addition of new flight plans daily. Older, no longer active, flight records are removed from the data base periodically with a cleanup operation similar to that of the OAG cleanup operation. Overflow will be minimized as with the OAG Data Base, except FATS ranges will not be determined dynamically. The SPCX defines the FATS table entries and can be tailored to meet the requirements for online updating.

3.2.3 CFC Data Base Table Sets

The Data Base Table Sets provide indexing, validation, and conversion capabilities within the CFC System. Section 3.3.1 lists these table sets alphabetically and according to their hierarchial structure within the system. The purpose and content of each table set is outlined in the OPCX COMPOOL and provides the user with a thorough understanding of their content, structure, and purpose.

Information is put into table sets by either the Create Table Entry Component or the Set Table Component of the Data Base Management Subsystem. The information in table sets may be accessed by one of three modes: 1) The Normal Access Mode, a table-dependent internal mode of access determined by the Data Base Administrator; 2) the Relative Record Access Mode, whereby the relative record to be accessed is specified, and 3) the Internal Index Access Mode, whereby the internal

code for the record to be accessed is specified and used as an index to a record. All Data Base Sets are similar in design and conform to the Standard Set Format as outlined in Figure 3.1.3-1. The Standard Set, elements of which are applicable to all Data Base sets, is described as if it were an actual set. The format of actual sets are given as variations of the Standard Set and are described in the Data Base hierarchy diagrams of Section 3.3. The Standard Set contains four record types. The first record, the Standard Block Header Record, is consistent in size and format among both Table and Record Sets and is used for identification and linkage of logical data blocks within the set. The second record, the Standard Table Validation Record, is applicable only to Table Sets and contains information used to check the validity of every data-item within the Standard Table Data Record. The third record, the Standard Table Pointer Record, also applicable only to the Data Base Table Sets, is present when defined as the Internal Mode of Access by the Data Base Administrator. The fourth and last record type, the Standard Data Record, varies in format and content among the Data Base Sets. Figure 3.1.3-1 illustrates the hierarchial structure of the Standard Set. Figures 3.1.3-2 and 3.1.3-3 illustrate the two Internal Access Modes and format of table sets; while, Figure 3.1.3-4 illustrates the format for Flight Record Sets.

3.3 SYSTEM DATA HIERARCHY

This section presents a hierarchial description of both internal and external interface data sets of the Central Flow Control System. The hierarchy diagrams are presented within three principal groups: the CFC Data Base (3.3.1), which is common to both complexes; the data defined by the Operational Software Complex (OPCX) (3.3.2), and the data defined by the Support Software Complex (SPCX) (3.3.3).

The complex-specific data is further divided into groups by Subsystem for the OPCX and by major component for the SPCX. Each group is preceded by two alphabetical lists of the sets within that group; one list is ordered alphabetically by English language set name, the other alphabetically by symbolic (or COMPOOL) set name. For the OPCX and SPCX, there is a hierarchy of sets within each of the groups. These sets are organized into hierarchies to give a convenient way to discuss collection of sets. Only those sets at the lowest level of hierarchy (sets that do not include other sets) will appear in the alphabetical lists. Those "sets" at higher levels (sets of sets) are only convenient names for the collection of sets below them in the hierarchy. The hierarchy of sets is shown by indentation. Finally, within each group, there is a more detailed description of each set in the group. These descriptions are alphabetically ordered by symbolic (or COMPOOL) set name. The descriptions for each set use indentation to show the hierarchy of records, repeating groups, vectors, and data items. The COMPOOL and COMPOOL segment, within which the set is defined, is identified to facilitate easy cross reference for the reader.

Standard Table Set - STTS

Standard Block Header Record

Set Identifier (Data-Item)

Access Mode (Data-Item)

Relative Block Number Within Set (Data-Item)

Number of Record Slots Filled in This Block (Data-Item)

Number of Active Records in This Block (Data-Item)

Forward Overflow Block Pointer (Data-Item)

Backward Overflow Block Pointer (Data-Item)

Arrival Pacing Airport or Center (Data-Item)

Departure Pacing Airport or Center (Data-Item)

Free-Chain Forward Pointer (Data-Item)

Free-Chain Backward Pointer (Data-Item)

Standard Table Validation Record

Data-Item Validation Repeating Group

Repeating Group Indicator (Data-Item)

Length of Repeating Group (Data-Item)

Number of Repetitions of Repeating Group (Data-Item)

Locating of First Repeating Group (Data-Item)

Value Use Code (Data-Item)

Null Use Code (Data-Item)

Null Value of Data-Item(Data-Item)

Minimum Value of Data Item (Data-Item)

Maximum Value of Data Item (Data-Item)

Data-Item Location (Data-Item)

Length of Data-Item (Data-Item)

Type of Data-Item (Data-Item)

FIGURE 3.1.3-1 STANDARD TABLE SET (1 of 2)

Standard Table Pointer Record

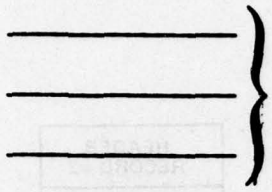
Pointer Vector

Key Value (Data-Item)

Standard Table Data Record

Record Status Indicator (Data-Item)

Key Value (Data-Item)



Data Unique to Individual Table Set

FIGURE 3.1.3-1 Standard Table Set (2 of 2)

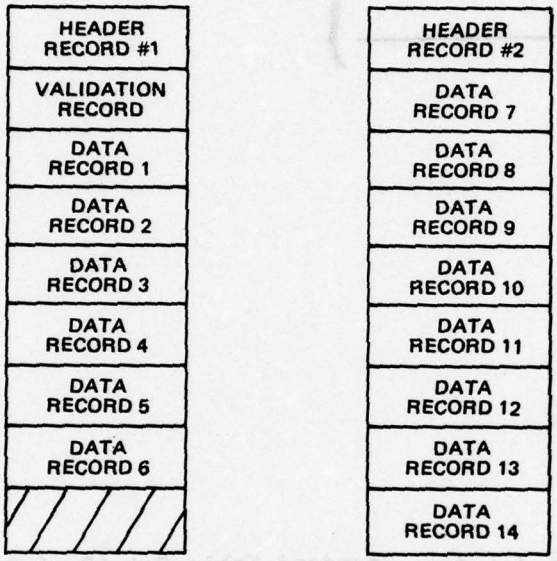
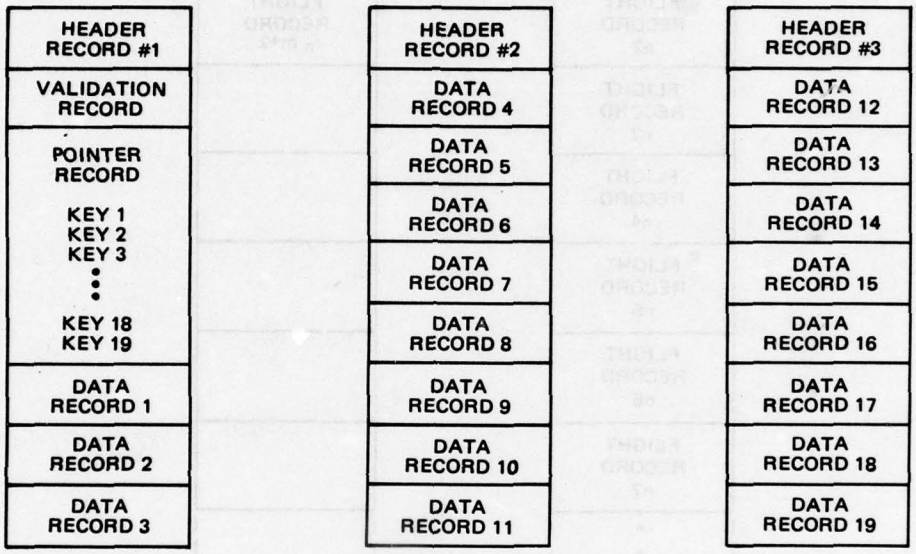


Figure 3.1.3-2. Search Data Record Format*
(Table-dependent, Normal Access Mode=0)

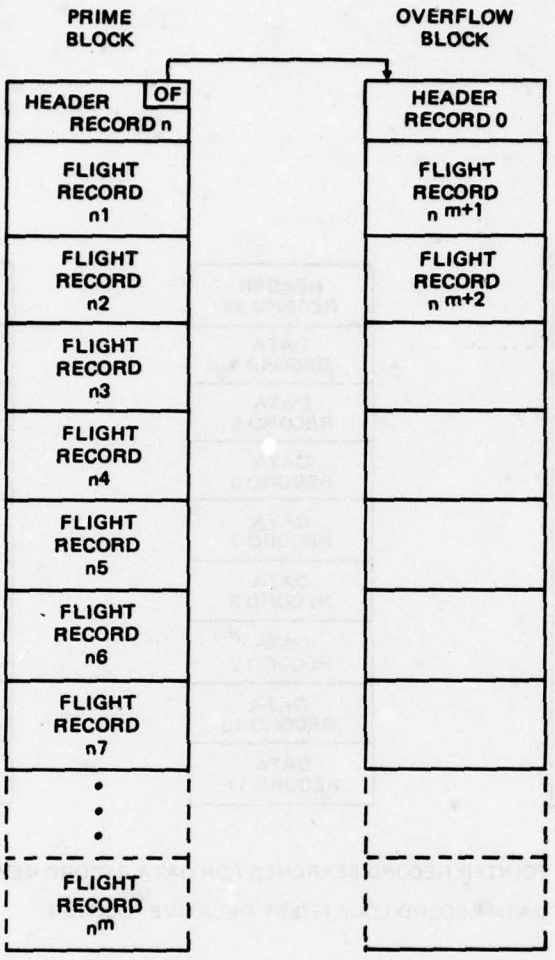
*Applicable to Table Sets Only



- POINTER RECORD SEARCHED FOR DATA RECORD KEY
- DATA RECORD LOCATED BY RELATIVE POSITION

Figure 3.1.3-3. Search Pointer Record Format*
(Table-dependent, Normal Access Mode=1)

*Applicable to Table Sets Only



- EACH FLIGHT RECORD SET BLOCK (INCLUDING OVERFLOW, IF PRESENT) CONTAINS ALL FLIGHT PLANS FOR A DESIGNATED ARRIVAL/DEPARTURE TERMINAL PAIR
- FLIGHT RECORDS ARE LOCATED VIA ARRIVAL/DEPARTURE TERMINAL INDEXING OR BY FLIGHT ACCESSION/FLIGHT INDEX TABLE SET PROCESSING

Figure 3.1.3-4. Flight Record Set Format

3.3.1 Central Flow Control Data Base

CFC Data Base Sets in alphabetical order by English language set name:

SET NAME	TWO CHARACTER SYMBOLIC NAME
Aircraft Class Table Set	PK
Aircraft Type Table Set	PY
Aircraft Type Conversion Table Set	PW
Airline Operator Table Set	AO
Airline Operator Conversion Table Set	VW
Airport Table Set	AJ
Airport Fix Table Set	AF
Arrival Fix Table Set	AV
Center Table Set	CP
Continue Table Set	CO
Non-OAG Arrival/Departure Table Set	NS
Non-OAG Flight Accession Table Set	XY
Non-OAG Flight Index Table Set	XI
Non-OAG Flight Record Set	NF
Non-OAG Housekeeping Table Set	HK
Non-OAG Name Table Set	NO
Normal Capacity Table Set	NY
Normal General Aviation Estimate Table Set	NJ
OAG Arrival/Departure Table Set	OS
OAG Flight Accession Table Set	YX
OAG Flight Index Table Set	IX
OAG Flight Record Set	OF

SET NAME	TWO CHARACTER SYMBOLIC NAME
OAG Housekeeping Table Set	HS
Operational Category Table Set	OK
Output Device Table Set	OD
Output Format Table Set	OX
Parameter Table Set	PT
Table Mapping Table Set	TZ
Transaction Error Message Table Set	MM
User-Supplied Capacity Table Set	UY
User-Supplied General Aviation Estimate Table Set	UJ
Zone Table Set	ZO

CFC Data Base Sets in alphabetical order by symbolic set name:

AF, AJ, AO, AV, CO, CP, HK, HS, IX, MM, NF, NJ, NO, NS, NY, OD, OF, OK, OS, OX, PK, PT, PW, PY, TZ, UJ, UY, VW, XI, XY, YX, ZO.

Hierarchy of sets in the Central Flow Control Data Base:

CFC Data Base Set

OAG Data Base Set

Airline Operator Table Set - AO

OAG Flight Record Set - OF

OAG Flight Accession Table Set - YX

OAG Flight Index Table Set - IX

OAG Housekeeping Table Set - HS

OAG Arrival/Departure Table Set - OS

Non-OAG Data Base Set

Non-OAG Name Table - NO

Non-OAG Flight Record Set - NF

Non-OAG Flight Accession Table Set - XY

Non-OAG Flight Index Table Set - XI

Non-OAG Housekeeping Table Set - HK

Non-OAG Arrival/Departure Set - NS

CFC Data Base General Table Sets

Aircraft Class Table Set - PK

Aircraft Type Table Set - PY

Aircraft Type Conversion Table Set - PW

Airline Operator Conversion Table Set - VW

Airport Table Set - AJ

Airport Fix Table Set - AF

Arrival Fix Table Set - AV

Center Table Set - CP

Continue Table Set - CO

Normal Capacity Table Set - NY

Normal General Aviation Estimate Table Set - NJ

Operational Category Table Set - OK

Output Device Table Set - OD

Output Device Table Set - OD

Output Format Table Set - OX

Parameter Table Set - PT

Table Mapping Table Set - TZ

Transaction Error Message Table Set - MM

User-Supplied Capacity Table Set - UY

User-Supplied General Aviation Estimate Table Set - UJ

Zone Table Set - ZO

AF Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in AF Set (Data-Item)

Number of Words/Entry in AF Set (Data-Item)

Maximum Occurrences of Airport Fix Vector (Data-Item)

Airport Fix Table Set - AF

Standard Block Header Record

Set Identifier = AF (Data-Item)

Standard Table Validation Record

Airport Fix Table Data Record

Status Indicator (Data-Item)

Key Value = Pacing Airport External Identifier (Data-Item)

Number of Fixes for This Airport (Data-Item)

Fix Vector

Fix External Identifier (Data-Item)

AJ Parameter Set

Actual Number of Pacing Airports (Data-Item)

Maximum Number of Pacing Airports (Data-Item)

Length of Data Record (Data-Item)

Number of Entries in AJ Set (Data-Item)

Number of Words/Entry in AJ Set (Data-Item)

Airport Table Set - AJ

Standard Block Header Record

Set Identifier = AJ (Data-Item)

Standard Table Validation Record

Airport Table Data Record

Status Indicator (Data-Item)

Key Value = Airport External Identifier (Data-Item)

Airport Internal Code (Data-Item)

Pacing/Non-Pacing Indicator (Data-Item)

Gate Time/Departure Time Difference (Data-Item)

Center Containing Airport External Identifier (Data-Item)

AO Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in AO Set (Data-Item)

Number of Words/Entry in AO Set (Data-Item)

Airline Operator Table Set - AO

Standard Block Header Record

Set Identifier = AO (Data-Item)

Standard Table Validation Record

Airline Operator Table Data Record

Status Indicator (Data-Item)

Key Value = Airline Operator External Identifier (Data-Item)

Operational Category for This Operator (Data-Item)

Airline Operator Internal Code (Data-Item)

AV Parameter Set

Maximum Occurrences of Departure Airport Repeating Group (Data-Item)

Length of Data Record in Bytes (Data-Item)

Number of Entries in AV Set (Data-Item)

Number of Words/Entry in AV Set (Data-Item)

Arrival Fix Table Set - AV

Standard Block Header Record

Set Identifier = AV (Data-Item)

Standard Table Validation Record

Standard Table Pointer Record

Arrival Fix Table Data Record

Status Indicator (Data-Item)

Arrival Airport External Identifier (Data-Item)

Key Value = Fix External Identifier (Data-Item)

Number of Departure Airport Repeating Groups (Data-Item)

Departure Airport Repeating Group

Departure Airport Internal Code (Data-Item)

Percentage of Estimated Time Enroute Expired at this Fix (Data-Item)

CO Parameter Set

Maximum Occurrences of Hold Chronology Repeating Group (Data-Item)

Maximum Occurrences of Zone Chronology Repeating Group (Data-Item)

Maximum Occurrences of Delay Value Vector (Data-Item)

Length of Data Record in Bytes (Data-Item)

Number of Entries in CO Set (Data-Item)

Number of Words/Entry in CO Set (Data-Item)

Continue Table Set - CO

Standard Block Header Record

Set Identifier = CO (Data-Item)

Standard Table Validation Record

Standard Table Pointer Record

Continue Table Data Record

Status Indicator (Data-Item)

Key Value = Pacing Airport External Identifier (Data-Item)

Simulation Type (Data-Item)

Simulation Stop Time (Data-Item)

Report Start Time (Data-Item)

Report Stop Time (Data-Item)

Number of Hold Chronology Repeating Groups

Hold Chronology Repeating Group

Hold Time Epoch (Data-Item)

Hold Time Value (Data-Item)

Previous Stack Time (Data-Item)

Previous Stack Size (Data-Item)

Number of Zone Chronology Repeating Groups (Data-Item)

Zone Chronology Repeating Group

    Zone Access Key (Data-Item)

    Zone Entry Time (Data-Item)

    Zone Exit Time (Data-Item)

Number of Entries in Delay Vector (Data-Item)

Delay Vector

    Delay Value (Data-Item)

CP Parameter Set

Actual Number of Centers (Data-Item)

Maximum Number of Centers (Data-Item)

Maximum Occurrences of Pacing Airport Vector (Data-Item)

Maximum Occurrences of Non-Pacing Airport Vector (Data-Item)

Length of Data Record in Bytes (Data-Item)

Number of Entries in CP (Data-Item)

Number of Words/Entry in CP (Data-Item)

Center Table Set - CP

Standard Block Header Record

Set Identifier = CP (Data-Item)

Standard Table Validation Record

Standard Table Pointer Record

Center Table Data Record

Status Indicator (Data-Item)

Key Value = Center External Identifier (Data-Item)

Center Internal Code (Data-Item)

Number of Pacing Airports for This Center (Data-Item)

Pacing Airport Vector

Pacing Airport Internal Code (Data-Item)

Number of Non-Pacing Airports for This Center (Data-Item)

Non-Pacing Airport Vector

Non-Pacing Airport Internal Code (Data-Item)

HK Parameter Set

Length of Data Record in Bytes (Data-Item)

Length of Data Record in Words (Data-Item)

Number of Entries in HK Repeating Group (Data-Item)

Number of Words/Entry in HK Repeating Group (Data-Item)

Non-OAG Housekeeping Record Set - HK

Standard Block Header Record

Set Identifier = HK (Data-Item)

Standard Table Validation Record

Housekeeping Set Record

Status Indicator (Data-Item)

Key Value = Relative Record 0 (Data-Item)

Number of Actual Repeating Groups (Data-Item)

Housekeeping Set Repeating Group

Object Set External Identifier (Data-Item)

Pointer to First Block in Free Chain (Data-Item)

Maximum Number of Blocks in This Set (Data-Item)

Number of Free Blocks in This Set (Data-Item)

Free Chain Alarm Point Percentage (Data-Item)

Number of Overflow Blocks in This Set (Data-Item)

Flight Index Set Next Record Number (Data-Item)

HS Parameter Set

Length of Data Record in Bytes (Data-Base)

Length of Data Record in Words (Data-Item)

Number of Entries in HS Repeating Group (Data-Item)

Number of Words/Entry in HS Repeating Group (Data-Item)

OAG Housekeeping Record Set - HS

Standard Block Header Record

Set Identifier = HS (Data-Item)

Standard Table Validation Record

Housekeeping Set Record

Status Indicator (Data-Item)

Key Value = Relative Record 0 (Data-Item)

Number of Actual Repeating Groups (Data-Item)

Housekeeping Set Repeating Group

Object Set External Identifier (Data-Item)

Pointer to First Block in Free Chain (Data-Item)

Maximum Number of Blocks in This Set (Data-Item)

Number of Free Blocks in This Set (Data-Item)

Free Chain Alarm Point Percentage (Data-Item)

Number of Overflow Blocks in This Set (Data-Item)

Flight Index Set Next Record Number (Data-Item)

IX Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in IX (Data-Item)

Number of Words/Entry in IX (Data-Item)

Number of FITS Repeating Groups (Data-Item)

Length of FITS Repeating Group (Data-Item)

OAG Flight Index Table Set - IX

Standard Block Header Record

Set Identifier = IX (Data-Item)

Standard Table Validation Record

OAG Flight Index Table Data Record

Status Indicator (Data-Item)

Overflow Indicator for This Airline Range

Key Value = Flight Index Table Data Record Number (Data-Item)

Airline Operator Internal Code (Data-Item)

Actual Number of Flight Record Location Repeating Groups (Data-Item)

Flight Record Location Repeating Group

Delete Flag for Flight Leg Entry (Data-Item)

Flight Leg Relative Record Number (Data-Item)

Arrival Center or Pacing Airport Internal Code (Data-Item)

Departure Center or Pacing Airport Internal Code (Data-Item)

Aircraft Identification (Data-Item)

MM Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in MM (Data-Item)

Number of Words/Entry in MM (Data-Item)

Maximum Number of Entries in MM Text (Data-Item)

Transaction Error Message Table Set - MM

Standard Block Header Record

Set Identifier = MM (Data-Item)

Standard Table Validation Record

Transaction Error Message Table Data Record

Status Indicator (Data-Item)

Key Value = Transaction Error Message Code (Data-Item)

Length of Part 1 of Message (Data-Item)

Length of Part 2 of Message (Data-Item)

Error Message Text (Data-Item)

NF Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in NF (Data-Item)

Number of Words/Entry in NF (Data-Item)

Non-OAG Flight Record Set - NF

Standard Block Header Record

Set Identifier = NF (Data-Item)

Non-OAG Flight Record

Record Status (Data-Item)

Location of Record within Set (Data-Item)

Arrival Airport Internal Code (Pacing or Non-Pacing) (Data-Item)

Departure Airport Internal Code (Pacing or Non-Pacing) (Data-Item)

Aircraft Identification (Data-Item)

Aircraft Type Internal Code (Data-Item)

Aircraft Class Internal Code (Data-Item)

Departure Data Mask (Data-Item)

Activation/Deactivation Date Mask (Data-Item)

Scheduled Departure Time (Data-Item)

Actual Departure Time (Data-Item)

Controlled Departure Time (Data-Item)

Estimated Time EnRoute (Data-Item)

Departure Center Internal Code (Data-Item)

Non-OAG Call Sign Character Internal Code (Data-Item)

Controlled Arrival Time (Data-Item)

NJ Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in NJ

Number of Words/Entry in NJ

Maximum Occurrences of Estimate Vector (Data-Item)

Normal General Aviation Table Set - NJ

Standard Block Header Record

Set Identifier = NJ (Data-Item)

Standard Table Validation Record

Normal General Aviation Table Data Record

Status Indicator (Data-Item)

Key Value = Pacing Airport External Identifier (Data-Item)

Normal General Aviation Estimate Vector

Normal General Aviation Estimate for an Hour (Data-Item)

NO Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in NO (Data-Item)

Number of Words/Entry in NO (Data-Item)

Non-OAG Name Table Set - NO

Standard Block Header Record

Set Identifier = NO (Data-Item)

Standard Table Validation Record

Non-OAG Name Table Data Record

Status Indicator (Data-Item)

Operational Category for Operator Call Sign Character (Date-Item)

Key Value = First Character of the Non-OAG Call Sign (Data-Item)

Non-OAG Name Internal Code (Data-Item)

NS Parameter Set

Length of Data Record in Bytes (Data-Item)

Maximum Occurrences of Departure Vector (Data-Item)

Number of Entries in NS (Data-Item)

Number of Words/Entry in NS (Data-Item)

Non-OAG Arrival/Departure Table Set - NS

Standard Block Header Record

Set Identifier = NS (Data-Item)

Standard Table Validation Record

Non-OAG Arrival/Departure Table Data Record

Status Indicator (Data-Item)

Key Value = Arrival Center or Pacing Airport
External Identifier (Data-Item)

Arrival Center or Pacing Airport Internal Code (Data-Item)

Departure Center or Pacing Airport Vector

NFRS Flight Record Block Number for an
Arrival/Departure Pair (Data-Item)

NY Parameter Set

Maximum Occurrences of Capacity Vector (Data-Item)

Length of Data Record in Bytes (Data-Item)

Number of Entries in NY (Data-Item)

Number of Words/Entry in NY (Data-Item)

Normal Capacity Table Set - NY

Standard Block Header Record

Set Identifier = NY (Data-Item)

Standard Table Validation Record

Normal Capacity Table Data Record

Status Indicator (Data-Item)

Key Value = Pacing Airport External Identifier (Data-Item)

Zero Stack Hour (Data-Item)

Normal Capacity Vector

Normal Capacity for an Hour (Data-Item)

OD Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in OD (Data-Item)

Number of Words/Entry in OD (Data-Item)

Maximum Occurrences of Output Device Repeating Group (Data-Item)

Output Device Table Set - OD

Standard Block Header Record

Set Identifier = OD (Data-Item)

Standard Table Validation Record

Output Device Table Data Record

Status Indicator (Data-Item)

Key Value = Output Device External Identifier (Data-Item)

Actual Number of Output Device Repeating Groups (Data-Item)

Output Device Repeating Group

Output Device External Identifier (Data-Item)

Output Device Internal Code (Data-Item)

OF Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in OF (Data-Item)

Number of Words/Entry in OF (Data-Item)

OAG Flight Record Set - OF

Standard Block Header Record

Set Identifier = OF (Data-Item)

OAG Flight Record

Record Status (Data-Item)

Location of Record Within Set (Data-Item)

Arrival Airport Internal Code (Pacing or Non-Pacing) (Data-Item)

Departure Airport Internal Code (Pacing or Non-Pacing) (Data-Item)

Aircraft Identification (Data-Item)

Aircraft Type Internal Code (Data-Item)

Aircraft Class Internal Code (Data-Item)

Aircraft Category Internal Code (Data-Item)

Departure Date Mask (Date-Item)

Activation/Deactivation Date Mask (Data-Item)

Scheduled Departure Time (Data-Item)

Actual Departure Time (Data-Item)

Controlled Departure Time (Data-Item)

Estimated Time EnRoute (Data-Item)

Departure Center Internal Code (Data-Item)

Airline Operator Internal Code

Controlled Arrival Time

OK Parameter Set

General Aviation External Identifier (Data-Item)

Air Taxi External Identifier (Data-Item)

Air Carrier External Identifier (Data-Item)

Military External Identifier (Data-Item)

Length of Data Record in Bytes (Data-Item)

Number of Entries in OK (Data-Item)

Number of Words/Entry in OK (Data-Item)

Operational Category Table Set - OK

Standard Block Header Record

Set Identifier = OK (Data-Item)

Standard Table Validation Record

Operational Category Table Data Record

Status Indicator (Data-Item)

Key Value = Operational Category External Identifier (Data-Item)

Operational Category Internal Code (Data-Item)

Length of Output External Name (Data-Item)

Output External Name Vector

Output External Name Character (Data-Item)

OS Parameter Set

Length of Data Record in Bytes (Data-Item)

Maximum Occurrences of Departure Vector (Data-Item)

Number of Entries in OS (Data-Item)

Number of Words/Entry in OS (Data-Item)

OAG Arrival/Departure Table Set - OS

Standard Block Header Record

Set Identifier = OS (Data-Item)

Standard Table Validation Record

OAG Arrival/Departure Table Data Record

Status Indicator (Data-Item)

Key Value = Arrival Center or Pacing Airport External Identifier (Data-Item)

Arrival Center or Pacing Airport Internal Code (Data-Item)

Departure Center or Pacing Airport Vector

OFRS Flight Record Block Number for an Arrival/Departure Pair (Data-Item)

OX Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in OX (Data-Item)

Number of Words/Entry in OX (Data-Item)

Maximum Occurrences of Output Format Repeating Group (Data-Item)

Length of Output Format Repeating Group (Data-Item)

Output Format Table Set - OX

Standard Block Header Record

Set Identifier = OX (Data-Item)

Standard Table Validation Record

Ourput Format Table Data Record

Status Indicator (Data-Item)

Key Value = Relative Record Number (0) (Data-Item)

Actual Number of Output Format Repeating Groups (Data-Item)

Output Format Repeating Group

Default Code (Data-Item)

Length of Format Title (Data-Item)

Output Format Identifier (Data-Item)

Output Format Title of the Identifier (Data-Item)

PK Parameter Set

Maximum Occurrences of Aircraft Type Vector (Data-Item)

Length of Data Record in Bytes (Data-Item)

Number of Entries in PK (Data-Item)

Number of Words/Entry in PK (Data-Item)

Aircraft Class Table Set - PK

Standard Block Header Record

Set Identifier = PK (Data-Item)

Standard Table Validation Record

Aircraft Class Table Data Record

Status Indicator (Data-Item)

Key Value = Aircraft Class External Identifier (Data-Item)

Internal Code for Aircraft Class (Data-Item)

Length of Output Format Title (Data-Item)

Output Format Title (Data-Item)

Number of Aircraft Types in This Class (Data-Item)

Aircraft Type Vector

Aircraft Type External Identifier (Data-Item)

PT Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in PT (Data-Item)

Number of Words/Entry in PT (Data-Item)

Parameter Table Set - PT

Standard Block Header Record

Set Identifier = PT (Data-Item)

Standard Table Validation Record

Parameter Table Data Record

Status Indicator (Data-Item)

Key Value = Relative Record Number (0) (Data-Item)

Stop Time (Data-Item)

Delay Factor Minimum (Data-Item)

Delay Factor Maximum (Data-Item)

Estimated Time Enroute Minimum (Data-Item)

Estimated Time Enroute Maximum (Data-Item)

Stack Time Minimum (Data-Item)

Stack Time Maximum (Data-Item)

Hold Time Minimum (Data-Item)

Hold Time Maximum (Data-Item)

Capacity Minimum (Data-Item)

Capacity Maximum (Data-Item)

Actual Number of Pacing Airports (Data-Item)

Maximum Number of Pacing Airports (Data-Item)

Actual Number of Centers (Data-Item)

Maximum Number of Centers (Data-Item)

Maximum I/O Time (Data-Item)

OFRS Effective Data (In EBCDIC-MMDDYY) (Data-Item)

NFRS Effective Date (In EBCDIC-MMDDYY) (Data-Item)

OFRS Effective Date (In Seconds since Epoch) (Data-Item)

NFRS Effective Date (In Seconds since Epoch) (Data-Item)

Stack Size Minimum (Data-Item)

Stack Size Maximum (Data-Item)

Active Flight Time Difference (Data-Item)

Julian Date of Reference (Data-Item)

Center GA Estimate Minimum (Data-Item)

Center GA Estimate Maximum (Data-Item)

Pacing Airport GA Estimate Minimum (Data-Item)

Pacing Airport GA Estimate Maximum (Data-Item)

OAG Day of Week (Data-Item)

Non-OAG Day of Week (Data-Item)

Delta Tee for (Offline) ETE Check (Data-Item)

Delta Tee for (Offline) Departure Time Check (Data-Item)

Delta Tee for (Online) Departure Time Check (Data-Item)

Current Day Parameter P1 (Data-Item)

Current Day Parameter P2 (Data-Item)

Current Day Parameter P3 (Data-Item)

Simulation Extension Limit (Data-Item)

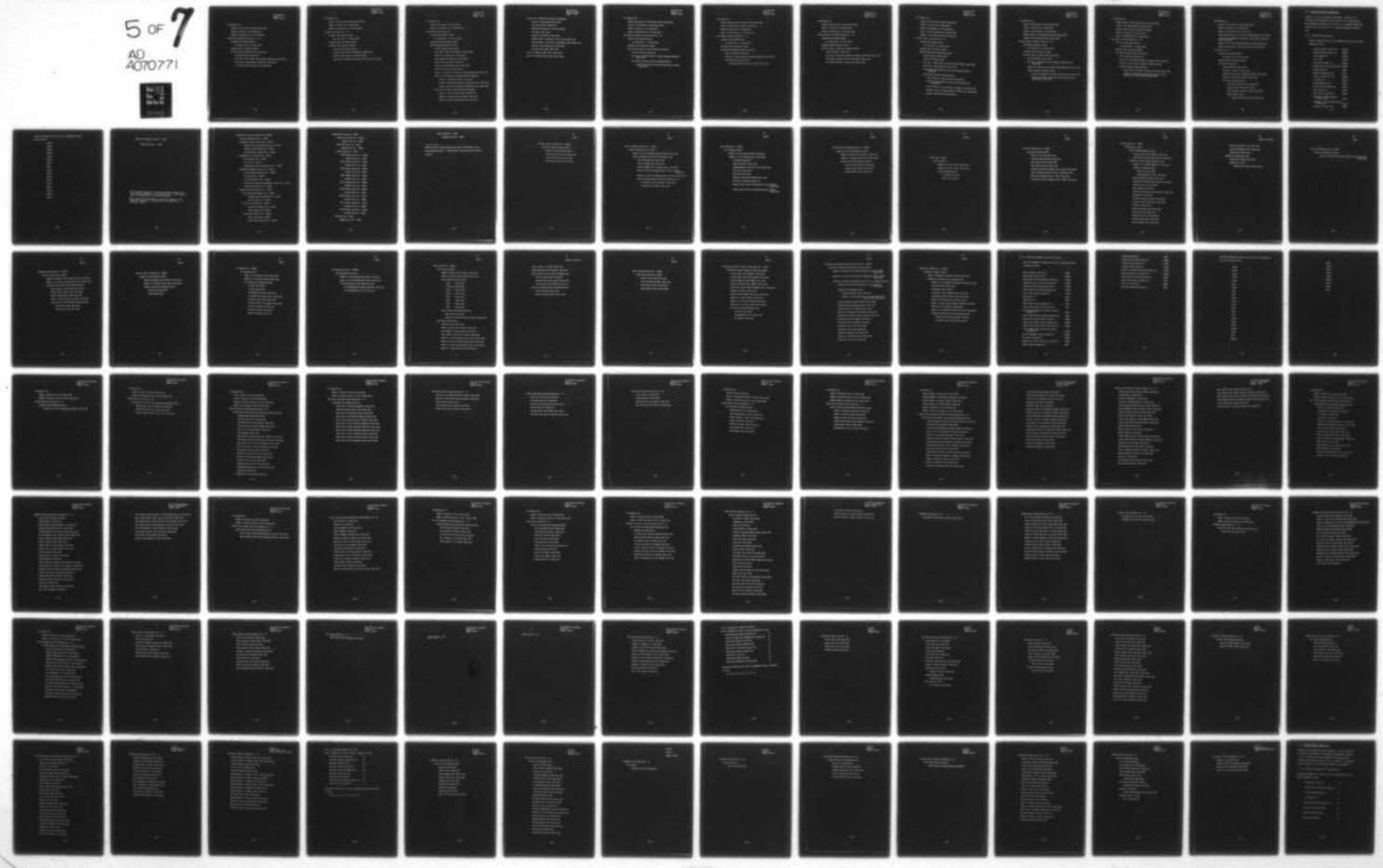
Delta Tee for Merge Time Limitations (Data-Item)

Delta Tee for Determining New Data Base Date (Data-Item)

AD-A070 771 COMPUTER SCIENCES CORP SILVER SPRING MD SYSTEM SCIEN--ETC F/G 9/2
CENTRAL FLOW CONTROL. SOFTWARE DESIGN DOCUMENT. VOLUME II. SUPP--ETC(U)
JAN 79 DOT-FA77WA-3955

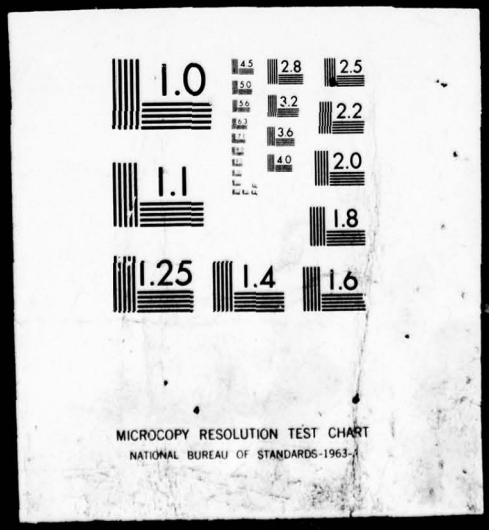
UNCLASSIFIED CSC/SD-78/6172(2) FAA-RD-79-33-2 NL

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A070771



PW Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in PW (Data-Item)

Number of Words/Entry in PW (Data-Item)

Aircraft Type Conversion Table Set - PW

Standard Block Header Record

Set Identifier = PW (Data-Item)

Standard Table Validation Record

Aircraft Type Conversion Table Data Record

Status Indicator (Data-Item)

Key Value = OAG Aircraft Type External Identifier (Data-Item)

CFC Aircraft Type External Identifier (Data-Item)

CFC Aircraft Type Internal Code (Data-Item)

PY Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in PY (Data-Item)

Number of Words/Entry in PY (Data-Item)

Aircraft Type Table Set - PY

Standard Block Header Record

Set Identifier = PY (Data-Item)

Standard Table Validation Record

Aircraft Type Table Data Record

Status Indicator (Data-Item)

Aircraft Class External Identifier (Data-Item)

Aircraft Type Internal Code (Data-Item)

Key Value = Aircraft Type External Identifier (Data-Item)

TZ Parameter Set

Number of Entries in TZ (Data-Item)

Number of Words/Entry in TZ (Data-Item)

Table Mapping Table Set - TZ

Standard Block Header Record

Set Identifier - TZ (Data-Item)

Standard Table Validation Record

Table Mapping Table Data Record

Status Indicator (Data-Item)

Key Value = Object Set Identifier (Data-Item)

Object Set Internal Code (Data-Item)

Index Offset for Object Set (Data-Item)

Object Set Access Mode (Data-Item)

Internal Code Generation Flag (Data-Item)

Object Set Block Size (Data-Item)

Location of Object Set's Entry in Housekeeping Set (Data-Item)

Object Set's Validation Record Descriptor Aggregate

Pointer to Validation Record (Data-Item)

Number of Data-Item Validation Repeating Group (Data-Item)

Length of Data-Item Validation Repeating Group (Data-Item)

Object Set's Pointer Record Descriptor Aggregate

Pointer to First Pointer Record (Data-Item)

Number of Pointer Repeating Groups (Data-Item)

Length of Pointer Repeating Group (Data-Item)

Object Set's Data Record Descriptor Aggregate

- Number of Data Records (Data-Item)
- Key Starting Byte (Data-Item)
- Maximum Data Records in Set (Data-Item)
- Key Length (Data-Item)
- Length of Data Record (Data-Item)
- Maximum Number of Records on First Block (Data-Item)
- Maximum Number of Records on Succeeding Blocks (Data-Item)
- Internal Code Starting Byte (Data-Item)
- Internal Code Length (Data-Item)

Label of Primary Access Table (Data-Item)

Label of Alternate Access Table (Data-Item)

UJ Parameter Set

Maximum Occurrences of GA Estimate Vector (Data-Item)

Length of Data Record in Bytes (Data-Item)

Number of Entries in UJ (Data-Item)

Number of Words/Entry in UJ (Data-Item)

User-Supplied General Aviation Table Set - UJ

Standard Block Header Record

Set Identifier = UJ (Data-Item)

Standard Table Validation Record

User-Supplied General Aviation Table Data Record

Status Indicator (Data-Item)

Key Value = Pacing Airport or Center External Identifier (Data-Item)

User-Supplied General Aviation Estimate Vector

User-Supplied General Aviation Estimate for an Hour (Data-Item)

UY Parameter Set

Maximum Occurrences of Capacity Vector (Data-Item)

Length of Data Record in Bytes (Data-Item)

Number of Entries in UY (Data-Item)

Number of Words/Entry in UY (Data-Item)

User-Supplied Capacity Table Set - UY

Standard Block Header Record

Set Identifier = UY (Data-Item)

Standard Table Validation Record

User-Supplied Capacity Table Data Record

Status Indicator (Data-Item)

Key Value = Pacing Airport External Identifier (Data-Item)

User-Supplied Capacity Vector

User-Supplied Capacity for an Hour (Data-Item)

VW Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in VW (Data-Item)

Number of Words/Entry in VW (Data-Item)

Airline Operator Conversion Table Set - VW

Standard Block Header Record

Set Identifier = VW (Data-Item)

Standard Table Validation Record

Airline Operator Conversion Table Data Record

Status Indicator (Data-Item)

Key Value = OAG Airline Operator External Identifier (Data-Item)

CFC Airline Operator External Identifier (Data-Item)

CFC Airline Operator Internal Code (Data-Item)

XI Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in XI (Data-Item)

Number of Words/Entry in XI (Data-Item)

Number of FITS Repeating Groups (Data-Item)

Length of FITS Repeating Group (Data-Item)

Non-OAG Flight Index Table Set - XI

Standard Block Header Record

Set Identifer = XI (Data-Item)

Standard Table Validation Record

Non-OAG Flight Index Table Data Record

Status Indicator (Data-Item)

Overflow Flag (Data-Item)

Key Value = Flight Index Table Data Record Number (Data-Item)

Non-OAG Call Sign Character (Data-Item)

Actual Number of Flight Record Location Repeating Groups (Data-Item)

Flight Record Location Repeating Group

Delete Flag for Flight Leg Entry (Data-Item)

Relative Record Number in Non-OAG Flight Record Set (Data-Item)

Arrival Center or Pacing Airport Internal Code (Data-Item)

Departure Center or Pacing Airport Internal Code (Data-Item)

Aircraft Identification (Data-Item)

XY Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in XY (Data-Item)

Number of Words/Entry in XY (Data-Item)

Maximum Number of FATS Repeating Groups (Data-Item)

Length of FATS Repeating Groups (Data-Item)

Non-OAG Flight Accession Table Set - XY

Standard Block Header Record

Set Identifier = XY (Data-Item)

Standard Table Validation Record

Non-OAG Flight Accession Table Data Record

Status Indicator (Data-Item)

Key Value = Non-OAG Call Sign Character Internal Code (Data-Item)

Number of Actual Flight Accession Repeating Groups (Data-Item)

Flight Accession Repeating Group

Upper Limit Range for Aircraft Identification (Data-Item)

Location of Flight Index Table Data Record for This Flight Range (Data-Item)

YX Parameter Set

Maximum Number of FATS Repeating Groups (Data-Item)

Length of FATS Repeating Group (Data-Item)

Length of Data Record in Bytes (Data-Item)

Number of Entries in YX (Data-Item)

Number of Words/Entry in YX (Data-Item)

OAG Flight Accession Table Set - YX

Standard Block Header Record

Set Identifier = YX (Data-Item)

Standard Table Validation Record

OAG Flight Accession Table Data Record

Status Indicator (Data-Item)

Key Value = OAG Airline Operator Internal Code (Data-Item)

Number of Actual Flight Accession Repeating Groups

Flight Accession Repeating Group

Upper Limit of Aircraft Identification Range (Data-Item)

Location of Flight Index Table Data Record for This Aircraft Identification Range (Data-Item)

ZO Parameter Set

Length of Data Record in Bytes (Data-Item)

Number of Entries in ZO (Data-Item)

Number of Words/Entry in ZO (Data-Item)

Maximum Occurrences of Tier Center Repeating Group (Data-Item)

Double Value of Maximum Occurrences of Tier Center Repeating Group (Data-Item)

Length of Tier Center Repeating Group in Words (Data-Item)

Maximum Occurrences of Origin Center Vector (Data-Item)

Zone Table Set - ZO

Standard Block Header Record

Set Identifier = ZO (Data-Item)

Standard Table Validation Record

Zone Table Data Record

Status Indicator (Data-Item)

Key Value = Zone Key (Data-Item)

Nominal Flight Time for Dummy GA Traffic (Data-Item)

Number of Actual Tier Centers (Data-Item)

Tier Center Repeating Group

Tier Center Internal Code (Data-Item)

Boundary Flight Time (Data-Item)

Actual Number of Origin Centers (Data-Item)

Origin Center Vector

Origin Center Internal Code (Data-Item)

3.3.2 Operational Software Complex Data

Section 3.3.2 has four principal subsections: Section 3.3.2.1 describes Executive Subsystem data; Section 3.3.2.2 describes Data Base Management Subsystem data; Section 3.3.2.3 describes Application Subsystem data, and Section 3.3.2.4 describes Simulation Subsystem data.

3.3.2.1 Executive Subsystem Data

Executive Subsystem (EX) Sets in Alphabetical Order by the English Language Set Name

Auxiliary Queue Directory Set	EXAQDS
Control Message Property Set	EXCMPS
File Property Set	EXFDRS
Lock ID Set	EXLIDS
Log Queue Directory Set	EXLQDS
Logical Device Reconfiguration Set	EXLDRS
Message Block Set	EXMBS
Monitor Communication Set	EXMCS
Optional Output Device Set	EXOODS
PE Property Set	EXPEPS
PE Reconfiguration Set	EXPERS
Physical Device Property Set	EXPDPS
Queue Control Set	EXQUCS
Spool Queue Directory Set	EXSQDS
Transaction Control Component Global Data Set	EXTCGS
Transaction Initiation/Termination Control Set	EXTITS
Transaction Property Set	EXTRPS

Executive Subsystem (EX) Data Sets in Alphabetical Order

By Set Acronym

EXAQDS

EXCMPS

EXFPRS

EXLDRS

EXLIDS

EXLQDS

EXMBS

EXMCS

EXOODS

EXPDPS

EXPEPS

EXPERS

EXQUCS

EXSQDS

EXTCGS

EXTITS

EXTRPS

*Executive Subsystem Data Set - EXSDS

†*Monitor Data Set - EXMCS

†The CFC Monitor Component is Government Furnished Software and data hierarchy information is not expanded here. See (CFC Monitor SDD) for an explanation of the monitor structure.

*These sets are not described here as they are composed of more basic data structures. A description of each basic data structure is given.

*Transaction Control Component Set - EXTCCS

Monitor Communication Set - EXMCS

*Transaction Device Control Set - EXTDCS

Logical Device Reconfiguration Set - EXLDRS

Optional Output Device Set - EXOODS

Physical Device Property Set - EXPDPS

*Transaction File Control Set - EXTFCS

File Property Set - EXFPRS

Lock ID Set - EXLIDS

Transaction Control Global Data Set - EXTCGS

*Transaction Message Control Set - EXTMCS

Control Message Property Set - EXCMPS

PE Property Set - EXPEPS

PE Reconfiguration Set - EXPERS

Transaction Initiation/Termination Control Set - EXTITS

Transaction Property Set - EXTRPS

*Transaction Queue Control Set - EXTQCS

*Auxiliary Queue Control Set - EXAQCS

Auxiliary Queue Directory Set - EXAQDS

Queue Control Set - EXQUCS

*Log Queue Control Set - EXLQCS

Log Queue Directory Set - EXLQDS

Queue Control Set - EXQUCS

*Spool Queue Control Set - EXSQCS

Queue Control Set - EXQUCS

Spool Queue Directory Set - EXSQDS

*Transaction Queue Set - EXTQS

*Archieve Log Queue Set - EXALQS

Message Block Set - EXMBS

*Auxiliary Queue Set - EXAQS

Message Block Set - EXMBS

*Incore Queue Set - EXIQS

*CIMC Message Queue Set - EXCMQS

Message Block Set - EXMBS

*IMLC Message Queue Set - EXIMQS

Message Block Set - EXMBS

*NIMC Message Queue Set - EXNMQS

Message Block Set - EXMBS

*OMLC Message Queue Set - EXOMQS

Message Block Set - EXMBS

*SIMC Message Queue Set - EXSMQS

Message Block Set - EXMBS

*SINC Message Queue Set - EXSNQS

Message Block Set - EXMBS

*SOTC Message Queue Set - EXSOQS

Message Block Set - EXMBS

*TITC Message Queue Set - EXTIQS

Message Block Set - EXMBS

*TMLC Message Queue Set - EXTMQS

Message Block Set - EXMBS

*Log Queue Set - EXLQS

Message Block Set - EXMBS

*Spool Queue Set - EXSQS

Message Block Set - EXMBS

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*These sets are not described here as they are composed of more basic data structures. A description of each basic data structure is given.

Auxiliary Queue Directory Set - EXAQDS

Auxiliary Queue Directory Record

Record in Use Flag (Data-Item)

Previous Record Pointer (Data-Item)

Next Record Pointer (Data-Item)

Owner Record Pointer (Data-Item)

Control Message Property Set - EXCMPS

Control Message Property Record

Number of Control Message Property Blocks (Data-Item)

Control Message Property Block Repeating Group

Control Message Name (Data-Item)

Control Message Type (Data-Item)

Control Message Input Processor Name (Data-Item)

Number of Control Message Property Queue ID Blocks (Data-Item)

Length of a Control Message Property PE Block (Data-Item)

Control Message Property PE Block Repeating Group

PE Property Status Indicator (Data-Item)

PE Property Set Offset (Data-Item)

File Property Set - EXFPRS

File Property Record

Number of File Property Blocks (Data-Item)

Length of a File Property Block (Data-Item)

File Name (Data-Item)

Status Indicator (Data-Item)

Maximum Number of Blocks in File (Data-Item)

Block Size (Data-Item)

Lock Name (Data-Item)

Physical Device Block Offset (Data-Item)

LDN Status Indicator (Data-Item)

Primary Logical Device Reconfiguration Block Offset (Data-Item)

Backup Logical Device Reconfiguration Block Offset (Data-Item)

Logical Device Reconfiguration Set - EXLDRS

Logical Device Reconfiguration Record

Number of Logical Device Blocks (Data-Item)

Length of a Logical Device Block (Data-Item)

Logical Device Block Repeating Group

Device Status Indicator (Data-Item)

Logical Device Number (Data-Item)

Logical Device Group (Data-Item)

Lock ID Set - EXLIDS

Lock ID Record

Number of Lock ID Blocks (Data-Item)

Length of a Lock ID Block (Data-Item)

Lock ID Repeating Group

Lock Name (Data-Item)

Lock ID (Data-Item)

Log Queue Directory Set - EXLQDS

Log Queue Directory Record

Record In Use Flag (Data-Item)

Previous Record Pointer (Data-Item)

Next Record Pointer (Data-Item)

Owner Record Pointer (Data-Item)

Enhanced/Initiation Message Pointer (OWN1) (Data-Item)

Output Immediate Message Pointer (OWN2)(Data-Item)

Termination Message Pointer (OWN3) (Data-Item)

Data Base Statistic Message Pointer (OWN4) (Data-Item)

Message Block Set - EXMBS

Message Block Record

Monitor Header Repeating Group

Source Logical Device Number (Data-Item)

Destination Logical Device Number (Data-Item)

Transaction Control Header Repeating Group

Length of TCC Header (Negative) (Data-Item)

Message ID Repeating Group

Epoch Time (Data-Item)

Unique Message ID Count (Data-Item)

Enhanced Message Address (Data-Item)

Transaction Property Block Address (Data-Item)

Message Source ID (Data-Item)

Spool Address (Data-Item)

Optional Output Device Block Address (Data-Item)

Message Type (Data-Item)

Transaction Control Options (Data-Item)

Optional Output Device Mask (Data-Item)

Process ID (Data-Item)

Enhanced Message Count (Data-Item)

Epoch Entry Time (Data-Item)

Greenwich Entry Time (Data-Item)

Greenwich Entry Date (Data-Item)

Epoch Log/Spool Time (Data-Item)

Greenwich Log/Spool Time (Data-Item)

Greenwich Log/Spool Date (Data-Item)

Simulation ID (Data-Item)

Message Text Repeating Group

Message Text Length (Data-Item)

Message Text Vector

Message Text Character (Data-Item)

Monitor Communication Set - EXMCS

Monitor Communication Record

Address of Transaction Control Component Global Data Set
(Data-Item)

Optional Output Device Set - EXOODS

Optional Output Device Record

Number of Optional Output Device Blocks (Data-Item)

Length of an Optional Output Device Block (Data-Item)

Optional Output Device Block Repeating Group

Source Logical Device Number (Data-Item)

Default Output Device Name (Data-Item)

Default Output Device LDN (Data-Item)

Number of Optional Output Devices (Data-Item)

Output Logical Device Number Repeating Group

Output Device Name (Data-Item)

Output Device LDN (Data-Item)

Physical Device Property Set - EXPDPS

Physical Device Property Record

Number of Physical Device Blocks (Data-Item)

Length of a Physical Device Block (Data-Item)

Physical Device Block Repeating Group

Device Type (Data-Item)

Option (Data-Item)

PE Property Set - EXPEPS

PE Property Record

Number of PE Property Blocks (Data-Item)

Length of a PE Property Block (Data-Item)

PE Property Block Repeating Group

PE Name (Data-Item)

PE Type (Data-Item)

PE Message Block Size (Data-Item)

PE Auxiliary Queueing Status (Data-Item)

Auxiliary Queue Count (Data-Item)

Auxiliary Queue PE ID Number (Data-Item)

PE Status Indicator (Data-Item)

Primary PE Offset (Data-Item)

Backup PE Offset (Data-Item)

PE Reconfiguration Set - EXPERS

PE Reconfiguration Record

Number of PE Reconfiguration Blocks (Data-Item)

Length of a PE Reconfiguration Block (Data-Item)

PE Reconfiguration Block Repeating Group

PE Reconfiguration Status Indicator (Data-Item)

PE Reconfiguration PE ID (Data-Item)

Queue Control Set - EXQUCS

Queue Control Record

Number of Queue Control Blocks (Data-Item)

Length of a Queue Control Block (Data-Item)

Record Selector Name (Vector)

'This ' (Data-Item)

'Previous' (Data-Item)

'Next ' (Data-Item)

'Owner ' (Data-Item)

'OWN1 ' (Data-Item)

'OWN2 ' (Data-Item)

'OWN3 ' (Data-Item)

'OWN4 ' (Data-Item)

Queue Control Block Repeating Group

Queue Name (Data-Item)

Address of Queue Name Control Record (Data-Item)

Queue Name Control Record

Queue Lock Name (Data-Item)

Length of Queue Control Record (Data-Item)

Total Number of Queue Records (Data-Item)

Total Number of Free Queue Records (Data-Item)

Length of a Pointer Record Control Block (Data-Item)

Number of Queue File Descriptor Blocks (Data-Item)

Length of a Queue File Descriptor Block (Data-Item)

Length of a Queue Record Block (Data-Item)

Pointer Length for QUCPNT (Data-Item)

Owned Repeating Group Dimension (Data-Item)

Pointer Record Control Block Repeating Group

    Pointer Record Name (Data-Item)

    Pointer Record Block Length (Data-Item)

    Record Block Entry Length (Data-Item)

Queue File Descriptor Block Repeating Group

    Queue File Name (Data-Item)

    Number of Queue Records (Data-Item)

Spool Queue Directory Set - EXSQDS

Spool Queue Directory Records

Record in Use Flag (Data-Item)

Previous Record Pointer (Data-Item)

Next Record Pointer (Data-Item)

Owner Record Pointer (Data-Item)

Transaction Control Component Global Data Set - EXTCGS

Transaction Control Component Global Data Record

Current Epoch Time (Seconds) (Data-Item)

Current Epoch Time (Half-Seconds) (Data-Item)

Current Greenwich Time (HHMM) (Data-Item)

Current Greenwich Date (DDMMYY) (Data-Item)

Epoch Time to Most Recent Midnight (Sec) (Data-Item)

Message ID Counter (Data-Item)

Number of Small Before-Look Sets (Data-Item)

Length of a Monitor Header (Data-Item)

Number of Set Pointer Records (Data-Item)

Length of a Set Pointer Record (Data-Item)

Set Pointer Record Repeating Group

Set Name (Data-Item)

Reconfiguration Flag (Data-Item)

Set Address (Data-Item)

Transaction Initiation/Termination Control Set - EXTITS

Transaction Initiation/Termination Control Record

Number of Transaction Initiation/Termination Control Blocks (Data-Item)

Length of a Transaction Initiation/Termination Control Block (Data-Item)

Transaction Initiation/Termination Control Block Repeating Group

Transaction Initiation/Termination Status Indicator (Data-Item)

Transaction ID Repeating Group

Transaction EPOCH Time (Data-Item)

Address of this Transaction Initiation/Termination Control Block (Data-Item)

Accepted Enhanced Message Address (Data-Item)

Accepted Enhanced Message Length (Data-Item)

Transaction Status Indicator (Data-Item)

Transaction Property Block Address (Data-Item)

Transaction PE Property Block Address (Data-Item)

Data Base Work Area Address (Data-Item)

Data Base Work Area Length (Data-Item)

Transaction Start Time (Data-Item)

Transaction Stop Time (Data-Item)

Transaction Elapsed Time (Data-Item)

Length of a Statistics Block (Data-Item)

Transaction SVC Count (Data-Item)

Transaction Property Set - EXTRPS

Transaction Property Record

Number of Transaction Property Blocks (Data-Item)

Transaction Property Block Repeating Group

Length of this Transaction Property Block (Data-Item)

Transaction Name (Data-Item)

Transaction Type (Vector)

Transaction Input Processor Name (Data-Item)

Transaction Update Security Mask (Data-Item)

Length of Data Base Work Area (Data-Item)

Number of Transaction Property PE Blocks (Data-Item)

Before-Look Set Indicator (Data-Item)

Length of a Transaction Property PE Block (Data-Item)

Transaction Property PE Block Repeating Group

Transaction PE Status Indicator (Vector)

PE Property Block Pointer (Data-Item)

3.3.2.2 Data Base Management Subsystem (DB) Data

Data Base Management Subsystem (DB) Sets in Alphabetical Order By English Set Name.

Airline Operator Bit Map Set	AOBMS
Before/After Looks File Set	BLOOKS
Before/After Looks Header/Data Record Set	BLOKHS
Calculated Items From Flight Record Set	FCLITM
Create New Table Calling Sequence Set	CTABCS
Create Table Entry Calling Sequence Set	CTBECS
Delete Table Calling Sequence Set	DTABCS
Dummy Table Set	DUMS1
Dummy Table Set	DUMS2
Flight Record Items Validation Set	FRVAL
Flight Record Output Control Table Set	FROCT
Flight Record Retrieval Interface Calling Sequence Set	FRINT
Flight Record Retrieval Module Parameter Set	FRMPS
Flight Record Update Control Table Set	UPDCNT
Flight Record Update Module Parameter Set	UPDMPS
Flight Record Update Record Item Status Set	UPDRCS
Initial Flight Record Retrieval Calling Sequence Set	GTFRCS
Lock List Manager Calling Sequence Set	LLMGCS
Lock List Que Table Set	LLMQTS
Message, Lock Level, Lock Point Control Set	LCKCNT
Module General Parameter Set	MGPS

Reusable Switches Set	DUMJY
Standard Block Header Record Set	SBHRSH
Standard Data Validation Set	STDRSV
Standard Pointer Table Set	STDPRS
Standard Validation Record Description Set	STVRSY
Table Hierarchy Lock Sequence Set	HIERLS
Table Retrieval Calling Sequence Set	TABTCS
Update Table Calling Sequence Set	UTCSS
Work Area Address Set	DBDWA
Work Area Description Table Set	WADTS

Data Base Management Subsystem (DB) Data Sets in Alphabetical Order by Set Acronym Name.

AODBMS

BLOKHS

BLOOKS

CTABCS

CTBECS

DBDWA

DTABCS

DUMJY

DUMS1

DUMS2

FCLITM

FRINT

FRMPS

FROCT

FRVAL

GTFRCS

HEERLS

LCKCNT

LLMGCS

LLMQTS

MGPS

SBHRSH

STDPR

STDRSV

STVRSV

TABTCS

UPDGNT

UPDMPS

UPDRCS

UTCSS

WADTS

J9 Parameter Set

Number of Entries in J9 Set (Data-Item)

Number of Words Per Entry in J9 Set (Data-Item)

Airline Operator Bit Map Set - J9

Operator Bit Map Repeating Group

Bit Map for Get Next Flight Record Module (Data-Item)

JN Parameter Set

Number of Entries in JN Set (Data-Item)

Number of Words Per Entry in JN Set (Data-Item)

Before/After Look File Set - JN

Before/After Look File Item Description Repeating Group

Before/After Looks File Status (Data-Item)

Before/After Looks File Name (Data-Item)

Program Element Name for this File (Data-Item)

JW Parameter Set

Size in Bytes of JW Set (Data-Item)

Number of Entries in JW Set (Data-Item)

Number of Words Per Entry in JW Set (Data-Item)

Header Record Length of JW Set (Data-Item)

Before/After Look Header/Data Record Set - JW

Before/After Look Record Item Description Repeating Group

Program Element Name (Data-Item)

Data Base Data Set ID (Data-Item)

Data Base Data Set Block Number (Data-Item)

Data Base Data Set Record Length (Data-Item)

Month, Day, Year, Parameter (Data-Item)

Time Parameter (Data-Item)

Before/After Look Header-Record Indicator (Data-Item)

Before/After Look File Name Index to JW Set (Data-Item)

Last After Look for this TLM Indicator (Data-Item)

End of this After Look Set Indicator (Data-Item)

Before/After Look Set Name (Data-Item)

Before/After Look Block Count (Data-Item)

TLM After Look Record Sequence (Data-Item)

Unique ID for this TLM (Data-Item)

Dispatch Time for this TLM (Data-Item)

Dispatching Sequence for this TLM (Data-Item)

Unused Word (Data-Item)

Beginning of Data Record (Data-Item)

J0 Parameter Set

Number of Entries in J0 Set (Data-Item)

Number of Words Per Entry in J0 Set (Data-Item)

Calculated Items from Flight Record Set - J0

Calculated Items Repeating Group

Epoch Time of Scheduled Departure (Data-Item)

Scheduled Arrival Time of Day (Data-Item)

Epoch Time of Scheduled Arrival (Data-Item)

Epoch Time of Arrival Best Estimate (Data-Item)

Epoch Time of Departure Best Estimate (Data-Item)

Epoch Time of First Scheduled Departure (Data-Item)

Epoch Time of Second Scheduled Departure (Data-Item)

Epoch Time of Third Scheduled Departure (Data-Item)

Epoch Time of First Scheduled Arrival (Data-Item)

Epoch Time of Second Scheduled Arrival (Data-Item)

Epoch Time of Third Scheduled Arrival (Data-Item)

Create New Table Calling Sequence Set - D4

Address of New Table Description Buffer (Data-Item)

Address of Table Data Validation Buffer (Data-Item)

Caller Module ID(Data-Item)

Data Base Work Area Address (Data-Item)

Create Table Status Indicator (Data-Item)

Create Table Entry Calling Sequence Set - D3

Table ID of New Entry (Data-Item)

New Table Entry Key (Data-Item)

Location of New Table Entry (Data-Item)

Caller Module ID (Data-Item)

Data Base Work Area Address (Data-Item)

New Table Entry Status Indicator (Data-Item)

Delete Table Calling Sequence Set - D5

Delete Table ID (Data-Item)

Caller Module ID (Data-Item)

Data Base Work Area Address (Data-Item)

Delete Table Status Indicator (Data-Item)

J4 Parameter Set

Non-OAG Offset (Data-Item)

Number of OAG/NonOAG Entries in J4 Set (Data-Item)

Number of Words Per Entry in J4 Set (Data-Item)

Flight Record Item Validation Set - J4

Item Validation Repeating Group

Flight Record Item ID (Data-Item)

Item Displacement in Entry (Data-Item)

Number of Bytes in this Item (Data-Item)

Integer Indicator (Data-Item)

Overlay for Preset Items (Data-Item

Item Minimum Value (Data-Item)

Item Maximum Value (Data-Item)

J2 Parameter Set

Number of Entries in Set J2 (Data-Item)

Number of Words Per Entry in Set J2 (Data-Item)

Maximum Number of Items Per Entry (Data-Item)

Flight Record Output Control Table Set - J2

Output Control Item Description Repeating Groups

Number of Entries to Retrieve (Data-Item)

Number of Bytes Per Entry (Data-Item)

Number of Items Per Entry (Data-Item)

Flight Record Output Buffer Address (Data-Item)

Flight Record Item ID (Data-Item)

Displacement of Item in Entry (Data-Item)

J1 Parameter Set

Maximum Number of Air Carriers (Data-Item)

Maximum Number of Operational Categories (Data-Item)

Maximum Number of Aircraft Classes (Data-Item)

Maximum Number of Aircraft Types (Data-Item)

Number of Entries in J1 Set (Data-Item)

Number of Words Per Entry in J1 Set (Data-Item)

Flight Record Retrieval Interface Calling Sequence Set - J1

Flight Record Interface Item Description Repeating Group

Initial/Subsequent Request for Flight Records (Data-Item)

OAG/NonOAG File Indicator (Data-Item)

Relative Record/No-Relative-Record Retrieval Indicator

Aircraft ID Filter Request Indicator (Data-Item)

Number of Air Carriers Requested (Data-Item)

Departure/Arrival Terminal Filter Indicator (Data-Item)

Pacing-Airport/Center Departure Indicator (Data-Item)

Pacing-Airport/Center Arrival Indicator (Data-Item)

Time Filter Item Indicator (Data-Item)

Estimated Time EnRoute Filter Indicator (Data-Item)

Number of Requested Operation Categories (Data-Item)

Number of Requested Classes (Data-Item)

Number of Requested Types (Data-Item)

Estimated Time EnRoute Data Item (Data-Item)

Data Base Work Area Address (Data-Item)

Relative Record Number of Flight (Data-Item)

Aircraft ID of Requested Flight (Data-Item)

Retrieval Start Time (Data-Item)

Retrieval Stop Time (Data-Item)

Departure Airport for Requested Flights (Data-Item)

Departure Center for Requested Flights (Data-Item)

Arrival Aircraft for Requested Flights (Data-Item)

Arrival Center for Requested Flights (Data-Item)

Air Carrier ID of Requested Flights (Data-Item)

Aircraft Type of Requested Flights (Data-Item)

Operational Category of Requested Flights (Data-Item)

Aircraft Class of Requested Flights (Data-Item)

Epoch Reference Time for Retrieval (Data-Item)

Lock Level Indicator (Data-Item)

Flight Time Difference (Data-Item)

Transaction Message ID (Data-Item)

Flight Record Retrieval Module Parameter Set - J3

Flight Record Output Buffer Address (Data-Item)

Caller Module ID (Data-Item)

Retrieval Component ID (Data-Item)

Currently Executing Module ID (Data-Item)

Arrival/Departure Table Arrival Index (Data-Item)

Arrival/Departure Table Departure Index (Data-Item)

Flight Accession Table Set Index (Data-Item)

Flight Index Table Set Index (Data-Item)

Flight Index Table Set Block Number (Data-Item)

Flight Index Table Set Record Number (Data-Item)

Dummy Parameter (Data-Item)

Relative Record in this Block (Data-Item)

Dummy Parameter (Data-Item)

Flight Index Table Set Overflow Block (Data-Item)

Flight Index Table Set Overflow Indicator (Data-Item)

OAG/NonOAG File Indicator (Data-Item)

Flight Record File Access Mode (Data-Item)

Arrival Departure Terminal Indicator (Data-Item)

Airline Operator Interval Code (Data-Item)

Aircraft ID (Data-Item)

Table Mapping Table Subscript (Data-Item)

Look/No-Look Indicator (Data-Item)

Table Mapping Table Subscript (Data-Item)

Table Mapping Table Flight Index Set Subscript (Data-Item)

Table Mapping Table Flight Accession Set Subscript (Data-Item)

Flight Accession/Arrival-Departure History Status (Data-Item)

Flight Record Block Number (Data-Item)

Relative Record in Associated Table Set (Data-Item)

JC Parameter Set

Number of Entries in JC Set (Data-Item)

Number of Words Per Entry in JC Set (Data-Item)

Flight Record Update Control Table Set (Data-Item)

Record Update Item Description Repeating Group

Mode of this Update (Data-Item)

OAG/NonOAG File Indicator (Data-Item)

Air Carrier ID (Data-Item)

Aircraft ID (Data-Item)

Arrival Center/Pacing Airport ID (Data-Item)

Departure Center/Pacing Airport ID (Data-Item)

Relative Record Number (Data-Item)

Data Base Work Area Address (Data-Item)

Number of Update Items Input (Data-Item)

Flight Record Input Buffer Address (Data-Item)

Update Items ID (Data-Item)

Displacement of Item in Entry (Data-Item)

Update Message ID (Data-Item)

Retrieval Initial/Continue Flag (Data-Item)

No Update Unlock Indicator (Data-Item)

Flight Record Update Module Parameter Set - J8

Input Buffer Address (Date-Item)

Caller Module ID (Data-Item)

Update Flight Record Component ID (Data-Item)

Currently Executing Module ID (Data-Item)

Arrival/Departure Set Arrival Index (Data-Item)

Arrival/Departure Set Departure Index (Data-Item)

Flight Accession Table Index (Data-Item)

Flight Index Set Index (Data-Item)

Flight Index Set Block Number (Data-Item)

Flight Index Set Record Number (Data-Item)

Dummy Parameter (Data-Item)

Relative Record in Block (Data-Item)

Dummy Parameter (Data-Item)

Flight Index Set Overflow Block Number (Data-Item)

Flight Index Set Overflow Block Indicator (Data-Item)

OAG/NonOAG Flight Record File Indicator (Data-Item)

Flight Record File Access Mode (Data-Item)

Terminal Retrieval Indicator (Data-Item)

Airline Operator Internal Code (Data-Item)

Aircraft ID (Data-Item)

Table Mapping Table Subscript (Data-Item)

Lock Level Indicator (Data-Item)

Table Mapping Table Subscript to Arrival/Departure Set (Data-Item)

Table Mapping Table Flight Index Set Subscript (Data-Item)

Table Mapping Table Flight Accession Set Subscript (Data-Item)

Table Mapping Table Housekeeping Set Subscript (Data-Item)

Free Chain Number of Blocks Alarm Point (Data-Item)

Flight Record Update Status Indicator (Data-Item)

Flight Record Block Number (Data-Item)

Relative Record Number in Table (Data-Item)

JD Parameter Set

Number of Entries in JD Set (Data-Item)

Number of Words Per Entry in JD Set (Data-Item)

Flight Record Update Record Item Status Set - JD

Update Record Item Status Repeating Group

Insert Flight Record Items Required Indicator (Data-Item)

Update Flight Record Items Inhibited Indicator (Data-Item)

Initial Flight Record Retrieval Calling Sequence Set - GF

Caller Module ID (Data-Item)

Aircraft ID (Data-Item)

Airline Operator Code (Data-Item)

Dummy Parameter (Data-Item)

Arrival Terminal Internal Code (Data-Item)

Departure Terminal Internal Code (Data-Item)

Address of Core to Receive Entry (Data-Item)

Data Base Work Area Address (Data-Item)

OAG/NonOAG File Indicator (Data-Item)

Flight Record File Access Method (Data-Item)

Flight Record File Lock Indicator (Data-Item)

Retrieval by Terminal Indicator (Data-Item)

Output Buffer Address (Data-Item)

Retrieval Status Indicator (Data-Item)

Relative Record Number of Retrieved Flight (Data-Item)

JK Parameter Set

Number of Entries in Set JK (Data-Item)

Number of Words Per Entry in Set JK (Data-Item)

Lock List Manager Calling Sequence Set - JK

Calling Sequence Item Description Repeating Group

Entry Status Indicator (Data-Item)

Entry Function Indicator (Data-Item)

Set Name for this Lock Entry (Data-Item)

Block Number to be Locked (Data-Item)

Record Number to be Locked (Data-Item)

JL Parameter Set

Number of Entries in JL Set (Data-Item)

Number of Words Per Entry in JL Set (Data-Item)

Lock List Que Table Set - JL

Lock Que Item Description Repeating Group

First Que Entry Pointer (Data-Item)

Last Que Entry Pointer (Data-Item)

Entry Down Pointer (Data-Item)

Entry Up Pointer (Data-Item)

Que Entry Status (Data-Item)

Function of this Que Entry (Data-Item)

Entry Set Name (Data-Item)

Entry Block Number (Data-Item)

Entry Record Number (Data-Item)

Program Element ID (Data-Item)

JG Parameter Set

Number of Entries in Set JG (Data-Item)

Number of Words Per Entry in Set JG (Data-Item)

Message, Lock Level, Lock Point Control Set - JG

Lock Control Item Description Repeating Group

Message Type (Data-Item)

Set Name to be Locked for Message (Data-Item)

NonOAG Flight REcord Set Name (Data-Item)

OAG Flight Record Set Name (Data-Item)

Initial Lock Level for Message (Data-Item)

Initial Point of Unlock for Message (Data-Item)

Location of Unlock Point for Message (Data-Item)

Reduction Lock Level for Message (Data-Item)

Point of Reducable Lock for Message (Data-Item)

Module General Parameter Set - PP

Module Parameter Repeating Group

Data Base ID Number (Data-Item)

Component ID (Data-Item)

Table ID (Data-Item)

Caller Module ID (Data-Item)

Currently Executing Module Number (Data-Item)

Parameter Number (Data-Item)

Error Type Code (Data-Item)

Access Key (Data-Item)

Data Base Entry Number (Data-Item)

Buffer Address (Data-Item)

Data Base Access Start Time (Data-Item)

Data Base Access End Time (Data-Item)

Applications Program Buffer Address (Data-Item)

Entry Size (Data-Item)

Dummy Field (Data-Item)

Relative Record Number in Block (Data-Item)

Dummy Field (Data-Item)

Data Base Statistic Type Indicator (Data-Item)

Data Base Access Mode (Data-Item)

Data Base Status Indicator (Data-Item)

Data Base Lock Indicator (Data-Item)

Current TZ Set Subscript (Data-Item)

Data Base Function Indicator (Data-Item)

Key Change Indicator (Data-Item)

Relative Record in Table Indicator (Data-Item)

Relative Record in Block Indicator (Data-Item)

Reducable Switches Set - JY

Data Base Initial Statistic Switch (Data-Item)

Standard Block Header Record Set - SH

Set ID for a Table or Record Set (Data-Item)

Table or Record Set Block Status (Data-Item)

Table or Record Set Normal Access Mode (Data-Item)

Relative Block Number Within This Set (Data-Item)

Pointer to First Data Record in Block (Data-Item)

Number of Filled Records in this Block (Data-Item)

Number of Active Records in this Block (Data-Item)

Forward Overflow Block Pointer (Data-Item)

Backward Overflow Block Pointer (Data-Item)

Arrival Pacing Airport Internal Code (Data-Item)

Departure Pacing Airport Internal Code (Data-Item)

Forward Pointer to Free Chain (Data-Item)

Backward Pointer to Free Chain (Data-Item)

Standard Data Validation Set - SD

Standard Data Item Status (Data-Item)

Standard Data Item Key Value (Data-Item)

SN Parameter Set

Number of Entries in SN Set (Data-Item)

Number of Words Per Entry in SN (Data-Item)

Standard Pointer Table Set - SN

Standard Pointer Item Description Repeating Group

Pointer Key Value (Data-Item)

Standard Validation Record Description Set - SV

Repeating Group Level Indicator (Data-Item)

Length of this Level Repeating Group (Data-Item)

Number of Repetitions of this Level Repeating Group (Data-Item)

Location of First Repeating Group (Data-Item)

Maximum/Minimum Value Use Code (Data-Item)

Null Use Indicator Code (Data-Item)

Null Value for Signed Integer (Data-Item)

Null Value for EBCDIC Character Type (Data-Item)

Minimum Value for Signed Integer (Data-Item)

Minimum Value for EBCDIC Character Type (Data-Item)

Maximum Value for Signed Integer (Data-Item)

Maximum Value for EBCDIC Character Type (Data-Item)

Location of Data Item Within Record (Data-Item)

Length of Data Item in Bytes (Data-Item)

Type of Data Item (Data-Item)

JE Parameter Set

Number of Entries in JE Set (Data-Item)

Number of Work Per Entry in JE Set (Data-Item)

Table Hierarchy for Lock Sequence Set - JE

Hierarchy Sequence Item Description Repeating Group

Large After Look Set ID (Data-Item)

NONOAG Flight Record Set ID (Data-Item)

NONOAG Housekeeping Set ID (Data-Item)

NONAOG Arrival/Departure Table Set ID (Data-Item)

NONAOG Flight Index Table Set ID (Data-Item)

NONOAG Flight Accession Table Set ID (Data-Item)

OAG Flight Record Set ID (Data-Item)

OAG Housekeeping Set ID (Data-Item)

OAG Arrival/Departure Table Set (Data-Item)

OAG Flight Index Table Set ID (Data-Item)

OAG Flight Accession Table Set ID (Data-Item)

General Aviation User Table Set ID (Data-Item)

User Capacity Table Set ID (Data-Item)

Simulation Continue Table Set ID (Data-Item)

Before/After Look Tape ID (Data-Item)

Update Table Calling Sequence Set - D2

Table ID to be Updated (Data-Item)

Table Key (Data-Item)

Location of Updated Table Entry (Data-Item)

Table Entry Key Change Indicator (Data-Item)

Caller Module ID (Data-Item)

Data Base Work Area Address (Data-Item)

Table Update Status Indicator (Data-Item)

Table Retrieval Calling Sequence Set - D1

Table ID for Retrieval (Data-Item)

Table Retrieval Access Method (Data-Item)

Table Retrieval Key (Data-Item)

Table Retrieval Entry Number (Data-Item)

Location to Receive Table Entry (Data-Item)

Table Entry Size Expected (Data-Item)

Caller Module ID (Data-Item)

Data Base Work Area Address (Data-Item)

Table Lock/Unlock Indicator (Data-Item)

Table Retrieval Status Indicator (Data-Item)

Work Area Address Set - D7

Data Base Work Area Address (Data-Item)

Dummy Table Set - D8

Dummy Table Set - D9

Work Area Description Table Set - DT

Data Base Work Area Label (Data-Item)

Address of Message I.D. (Data-Item)

Address of Security Bit Mask (Data-Item)

Module Parameter Set Current Entry Number (Data-Item)

Address of Core Resident TZ Set (Data-Item)

Address of Core Resident Lock Que Set (Data-Item)

Address of Before/After Lock Set (Data-Item)

Address of Time/Date Fields (Data-Item)

Three Unused Words (Data-Item)

Lock Area Parameter (Data-Item)

3.3.2.3 Application Subsystem (AP) Data

Sets in alphabetical order by English language set name:

Application Data Base Identifier Set	F1
Application/Executive Message Block Header Set	F5
Application General Control Set	YP
Application General Parameter Set	ZP
Application Line Format Control Set	F4
Application Physical Element Set	F2
Application Place Set	E3
Application Report Time Set	E1
Application/Simulation Interface Set	E2

Application Subsystem (AP) Sets in alphabetical order by symbolic set name:

E1, E2, E3, F1, F2, F4, F5, YP. ZP

Application Report Time Set - E1

Report Start Time (Data-Item)

Report Stop Time (Data-Item)

Report Start Hour (Data-Item)

Report Stop Hour (Data-Item)

Application/Simulation Interface Set - E2

Stack Epoch Time (Data-Item)

Stack Time Hour (Data-Item)

Stack Time Minute (Data-Item)

Stack Size (Data-Item)

Zone Identifier (Data-Item)

Hold Time (Data-Item)

Estimated Time Enroute Cutoff (Data-Item)

Number of Departure Delays (Data-Item)

Departure Airport Vector

Departure Airport (Data-Item)

Departure-Delay Vector

Departure-Delay (Data-Item)

Test Capacity Vector

Test Capacity (Data-Item)

Application Place Set - E3

Place Indicator (Data-Item)

Center Internal Code (Data-Item)

Non-Pacing Airport Code (Data-Item)

Center External Code (Data-Item)

Number of Pacing Airports (Data-Item)

Internal Pacing Airport Vector

Pacing Airport (Data-Item)

External Pacing Airport Vector

Pacing Airport (Data-Item)

Application Data Base Identifier Set - F1

Center Table Identifier (Data-Item)

Airport Table Identifier (Data-Item)

Output Device Table Identifier (Data-Item)

Continue Table Identifier (Data-Item)

Normal Capacity Table Identifier (Data-Item)

Today Capacity Identifier (Data-Item)

Normal GA Identifier (Data-Item)

Today GA Identifier (Data-Item)

Zone Table Identifier (Data-Item)

Parameter Table Identifier (Data-Item)

Error Message Table Identifier (Data-Item)

Operational Category Table Identifier (Data-Item)

Class Table Identifier (Data-Item)

Type Table Identifier (Data-Item)

Airline Operator Table Identifier (Data-Item)

Output Format Table Identifier (Data-Item)

Airport Fix Table Identifier (Data-Item)

Non-OAG Name Table Identifier (Data-Item)

Arrival Fix Table Identifier (Data-Item)

Application Physical Element Set - F2

Physical Element Repeating Group

Physical Element Address (Data-Item)

Physical Element Length (Data-Item)

Application Line Format Control Set - F4

Line Format Repeating Group

Item Use Flag (Data-Item)

Item From Address (Data-Item)

Item Conversion Code (Data-Item)

Length Before Conversion (Data-Item)

Length After Conversion (Data-Item)

Output Line Position (Data-Item)

Application/Executive Message Block Header Set - F5

Source Logical Device Number (Data-Item)

Length of TCC Header (Data-Item)

Epoch Time (Data-Item)

Unique Message ID Count (Data-Item)

Enhanced Message Address (Data-Item)

Transaction Property Block Address (Data-Item)

Message Source ID (Data-Item)

Spool Address (Data-Item)

Output Device Block Address (Data-Item)

Message Type (Data-Item)

TCC Options Mask (Data-Item)

Output Device Mask (Data-Item)

Process ID (Data-Item)

Enhanced Message Count (Data-Item)

Epoch Entry Time (Data-Item)

Greenwich Entry Time (Data-Item)

Greenwich Entry Data (Data-Item)

Epoch Log/Spool Time (Data-Item)

Greenwich Log/Spool Time (Data-Item)

Greenwich Log/Spool Date (Data-Item)

Simulation ID (Data-Item)

Message Text Length (Data-Item)

Start of Message Text (Data-Item)

Application General Control Set - YP

Transaction Epoch Time (Data-Item)

Message Field Delimeter (Data-Item)

Message Element Delimeter (Data-Item)

Variable Delimeter One (Data-Item)

Variable Delimeter Two (Data-Item)

Message Block Address (Data-Item)

Error Message ID (Data-Item)

Error Message Text Address (Data-Item)

Error Message Text Length (Data-Item)

Output Device Mask (Data-Item)

Critical Error Indicator (Data-Item)

Simulation Type Indicator (Data-Item)

Application General Parameter Set - ZP

Maximum Number of Flight Legs (LIFP) (Data-Item)

Maximum Number of Flight Records (DLDY) (Data-Item)

Maximum Message Length (Data-Item)

Output Report PE (Data-Item)

Immediate Message PE (Data-Item)

Maximum Number of Flights (ACTV & INHB) (Data-Item)

Maximum Number of Flights (CXSD) (Data-Item)

Maximum Number of Flights (RS) (Data-Item)

Maximum Number of Flights (DESA & DESD) (Data-Item)

Maximum Number of Flights (DM) (Data-Item)

Maximum Number of Flights (FIXC) (Data-Item)

PGTD Delta Time (CXSD) (Data-Item)

Maximum Number of Fix Data Lines (Data-Item)

Maximum Fixes per Pacing Airport (Data-Item)

Maximum Fix ETE Entries (Data-Item)

Fix Report Stop Time Adjustment (Data-Item)

3.3.2.4 Simulation Subsystem (SI) Data

Sets in alphabetical order by English language set name:

Simulation Arrival Delay Set	G1
Simulation Energy Conservation Set	S3
Simulation Event List Set	S0
Simulation General Control Set	SM
Simulation General Parameter Set	ZM
Simulation Hold Count Set	S2
Simulation Quota Flow Set	QF
Simulation Real General Aviation Set	SJ
Simulation Sort Vector Set	S1

Simulation Subsystem (SI) Sets in alphabetical order by symbolic set name:

G1, S0, S1, S2, S3, SJ, SM, QF, ZM

Simulation Arrival Delay Set - G1

Arrival Delay Repeating Group

ARRD Hour (Data-Item)

Arrival Count (Data-Item)

Active FLight Count (Data-Item)

Landed Flight Count (Data-Item)

Average Delay (Data-Item)

Average Hold (Data-Item)

Peak Hold (Data-Item)

Peak Delay (Data-Item)

Number of Statistics (Data-Item)

Simulation Event List Set - SO

Event List Repeating Group

Event Type (Data-Item)

Event Relative Address (Data-Item)

Aircraft ID (Data-Item)

Proposed Departure Time (Data-Item)

Proposed Arrival Time (Data-Item)

Actual Departure Time (Data-Item)

Active/Proposed Flag (Data-Item)

Controlled Departure Time (Data-Item)

Controlled Arrival Time (Data-Item)

Landed Time (Data-Item)

Estimated Departure Time (Data-Item)

Estimated Arrival Time (Data-Item)

Departure Airport (Data-Item)

Subzone Index/Departure Center (Data-Item)

Departure Airport Internal Code (Data-Item)

Boundary Arrival Time (Data-Item)

Boundary Release Time (Data-Item)

Subzone Boundary Time (Data-Item)

Tier Center Internal Code (Data-Item)

Delay Incurred (Data-Item)

Estimated Time Enroute (Data-Item)

SI-OPCX

Array S1

Segment SIC005

Simulation Sort Vector Set - S1

Sort Vector

Integer Sort Value (Data-Item)

Simulation Hold Count Set - S2

Hold Count Vector

Hold Count (Data-Item)

Simulation Energy Conservation Set - S3

Energy Conservation Repeating Group

Hour of Day (Data-Item)

Average Control Delay (Data-Item)

Average Destination Delay (Data-Item)

Total Average Delay (Data-Item)

Arrival Aircraft Count (Data-Item)

Simulation Real General Aviation Set - SJ

Real General Aviation Vector

Hourly General Aviation Factor (Data-Item)

Simulation General Control Set - SM

Number of Arrival Events (Data-Item)

Simulation Continue Status Flag (Data-Item)

Airport Zero Stack Hour (Data-Item)

Airport Zero Stack Epoch (Data-Item)

ARRD Number of Report Entries (Data-Item)

SIADTB Number of Time Entries (Data-Item)

ARRD Report Number Index (Data-Item)

Event Type Indicator (Data-Item)

Start of Day Epoch (Data-Item)

Number of First Event (Data-Item)

Arrivals Before Stack Time (Data-Item)

Current Day Epoch (Data-Item)

Earliest Notice Time (Data-Item)

Quota Flow Start Index (Data-Item)

Number of Energy Conservation Entries (Data-Item)

Start Entry for Energy Conservation (Data-Item)

Quota Flow Report Entries (Data-Item)

Number of Flights to Report (Data-Item)

Simulation Stop Time (Data-Item)

Simulation Quota Flow Set - QF

Quota Flow Repeating Group

Hour of Day (Data-Item)

Hour Release Total (Data-Item)

Next Hour Release Total (Data-Item)

Dummy Release Total (Data-Item)

Center Release Rate Vector

Release Rate (Data-Item)

Next Center Release Rate Vector

Release Rate (Next) (Data-Item)

Subzone Total Vector

Hourly Subzone Release Count (Data-Item)

Quota Flow Zone ID Vector

Zone ID (Data-Item)

Simulation General Parameter Set - ZM

Minutes in Day (Data-Item)

Number of Event List Entries (Data-Item)

Earliest Notice Parameter (Data-Item)

Number of QF Table Entries (Data-Item)

3.3.3 Support Software Complex Data

Section 3.3.3 has three principal subsections. The data elements of the System Data Assembler (DA) Component are presented in Section 3.3.3.1. The Data Reduction and Analysis (RA) Component data elements are presented in Section 3.3.3.2. Section 3.3.3.3 presents the data elements of the On-Line Test Director (TA) Component.

3.3.3.1 System Data Assembler (DA) Component Data

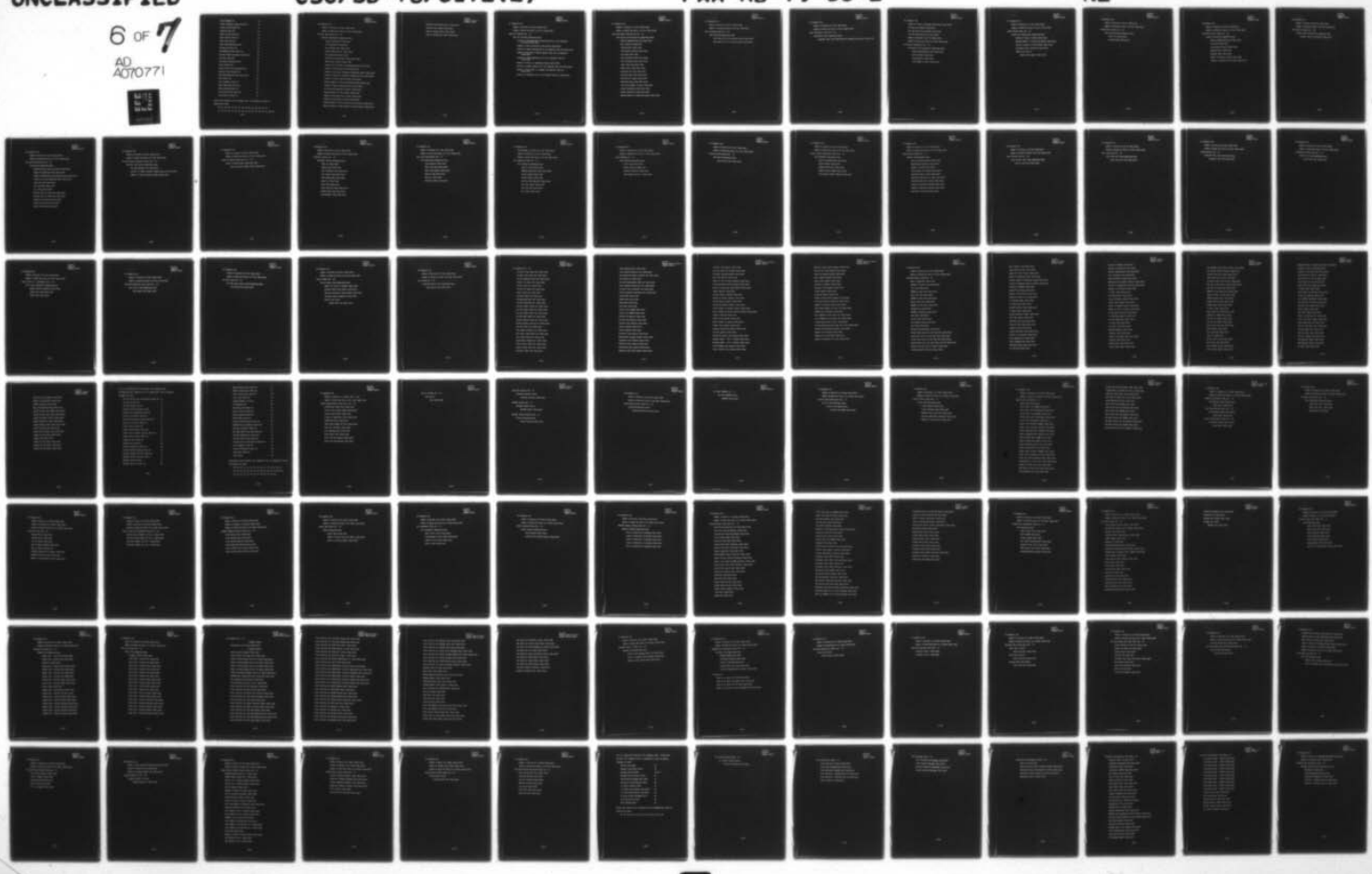
System Data Assembler (DA) Component sets in alphabetical order by English language set name:

Authorization Table Set	A8
Control Block Information Table Set	CO
DA Miscellaneous Items Set	YA
DA Parameter Set	ZY
Data Base Record Description Set	A2
Data Base Verification Set	B1
Data Set Description Set	AO
Data Set Pointer Set	A1

AD-A070 771 COMPUTER SCIENCES CORP SILVER SPRING MD SYSTEM SCIEN--ETC F/G 9/2
CENTRAL FLOW CONTROL. SOFTWARE DESIGN DOCUMENT. VOLUME II. SUPP--ETC(U)
JAN 79 DOT-FA77WA-3955

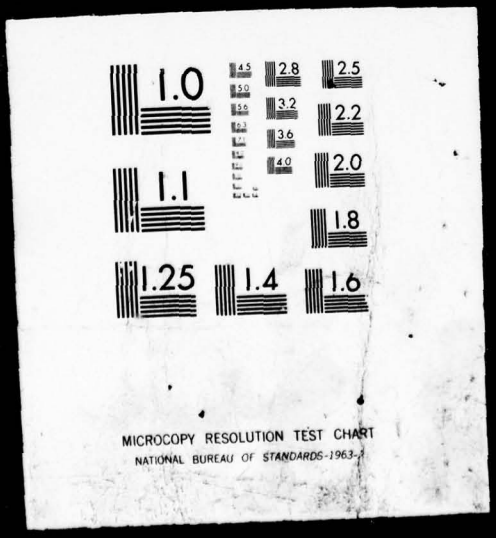
UNCLASSIFIED CSC/SD-78/6172(2) FAA-RD-79-33-2 NL

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Error Message Set	C4
Flight Accession Range Value Set	B3
Flight Record Header Set	C7
Formatted Data Set	H2
Header Format Table Set	A7
Input Control Card Set	H0
Input Data Card Set	H1
Input Data Description Set	C1
Interface Control Set	C0
Intermediate Buffer Data Set	H3
Non-OAG Flight Accession Pointer Set	B2
OAG Input Data Set	H7
OAG Record Description Set	A6
Output Header Set	H8
Output Print Line Information Set	H5
Retrieved Data Record Set	C5
Retrieved/Formatted Data Record Set	H6
Sort Buffer Set	H9
Sort Parameter Table Set	C3
Table Dependency Table Set	A4
Table Ordering Table Set	A3
Verification Data Table Set	A9
Verification Values Set	B0

System Data Assembler (DA) Component sets in alphabetical order by symbolic set name:

A0, A1, A2, A3, A4, A6, A7, A8, A9, B0, B1, B2, B3, C0, C1, C3, C4, C5, C6, C7, H0, H1, H2, H3, H5, H6, H7, H8, H9, YA, and ZY.

A0 Parameter Set

Number of Entries in A0 Set (Data-Item)

Number of Words Per Entry in A0 Set (Data-Item)

Data-Set Description Set - A0

Data-Set Description Repeating Group

Status Identifier (Data-Item)

Set Identifier (Data-Item)

Set Internal Code (Data-Item)

Index Offset for Set (Data-Item)

Set Access Mode (Data-Item)

Internal Code Generation Flag (Data-Item)

Block Size in Bytes (Data-Item)

Location of Set Entry in Housekeeping Set (Data-Item)

Pointer to Validation Record (Data-Item)

Number of Data-Item Validation Repeating Groups (Data-Item)

Length of Data-Item Validation Repeating Group (Data-Item)

Pointer to First Pointer Record (Data-Item)

Maximum Number of Pointer Repeating Groups (Data-Item)

Length of Pointer Repeating Group (Data-Item)

Key Field Starting Byte Location (Data-Item)

Maximum Number of Data Records (Data-Item)

Length of Retrieval Key in Bytes (Data-Item)

Length of Data Record in Bytes (Data-Item)

Maximum Number of Data Records for First Block (Data-Item)

Maximum Number of Data Records for Other Blocks (Data-Item)

Internal Code Starting Byte (Data-Item)

Internal Code Length (Data-Item)

Label of Primary Table (Data-Item)

Label of Alternative Table (Data-Item)

A1 Parameter Set

Number of Entries in A1 Set (Data-Item)

Number of Words Per Entry in A1 Set (Data-Item)

Data-Set Pointers Set - A1

Data Set Pointers Repeating Group

Pointer to Data Base Record Description Set A2 for Specific Data Set (Data-Item)

Number of Items in Specific Data Record (Data-Item)

Pointer to Table Ordering Set A3 for Specific Data Set (Data-Item)

Number of Data Sets on Which Specific Data Set is Dependent (Data-Item)

Pointer to Table Dependency Set A4 for Specific Data Set (Data-Item)

Number of Items in a Dependency Record (Data-Item)

Pointer to Header Format Set A7 for Specific Data Set (Data-Item)

Number of Print Lines in a Header for Specific Data Set (Data-Item)

Pointer to Validation Set B1 for Specific Data Set (Data-Item)

A2 Parameter Set

Number of Entries in A2 Set (Data-Item)

Number of Words Per Entry in A2 Set (Data-Item)

Data Base Record Description Set - A2

Data Record Item Description Repeating Group

Keyword Representing Item (Data-Item)

Word Location (Data-Item)

Starting Byte (Data-Item)

Item Length in Bytes (Data-Item)

Item Type (Data-Item)

Form Conversion Type (Data-Item)

Unit Conversion Type (Data-Item)

Input Item Flag (Data-Item)

Output Print Flag (Data-Item)

Retrieval Key Flag (Data-Item)

Multiple Value Flag (Data-Item)

Fixed Vector Length (Data-Item)

Repeating Group Flag (Data-Item)

Item Field Length in Bytes (Data-Item)

Create Validation Flag (Data-Item)

Update Validation Flag (Data-Item)

Maximum Number of Repeating Groups (Data-Item)

A3 Parameter Set

Number of Entries in A3 Set (Data-Item)

Number of Words Per Entry in A3 Set (Data-Item)

Table Ordering Table Set - A3

Table Ordering Repeating Group

First Data Set ID in Creation Order (Data-Item)

Next Data Set ID in Creation Order (Data-Item)

A4 Parameter Set

Number of Entries in A4 Set (Data-Item)

Number of Words Per Entry in A4 Set (Data-Item)

Table Dependency Table Set - A4

Dependency Record Repeating Group

Dependent Data Sets Identifiers for Specified Data Set (Data-Item)

A6 Parameter Set

Number of Items in OAG Tape Data Record (Data-Item)

OAG Tape Date Offset (Data-Item)

OAG Tape Data Record Length (Data-Item)

OAG Tape Blocking Factor (Data-Item)

Number of Entries in A6 Set (Data-Item)

Number of Words Per Entry in A6 Set (Data-Item)

OAG Record Description Set - A6

OAG Record Item Description Repeating Group

Keyword Representing Item (Data-Item)

Word Location (Data-Item)

Starting Byte (Data-Item)

Item Length in Bytes (Data-Item)

A7 Parameter Set

Number of Entries in A7 Set (Data-Item)

Number of Words Per Entry in A7 Set (Data-Item)

Header Format Table Set - A7

Format Line Description Repeating Group

Number of Lines in Header (Data-Item)

Minimum Number of Lines After Header (Data-Item)

Relative Location of Next Header (Data-Item)

Carriage Control Character (Data-Item)

Header Text Vector

Header Text Segment (Data-Item)

A8 Parameter Set

Number of Entries in A8 Set (Data-Item)

Number of Words Per Entry in A8 Set (Data-Item)

Authorization Table Set - A8

User Identification Repeating Group

User's ID (Data-Item)

Password Name (Data-Item)

A9 Parameter Set

Number of Entries in A9 Set (Data-Item)

Number of Words Per Entry in A9 Set (Data-Item)

Verification Data Table Set - A9

Keyword Description Repeating Group

Keyword Representing Item (Data-Item)

Item Type (Data-Item)

Item Length in Bytes (Data-Item)

Minimum Value (Data-Item)

Maximum Value (Data-Item)

Number of Distinct Values (Data-Item)

Pointer to Distinct Value Table (Data-Item)

B0 Parameter Set

Number of Entries in B0 Set (Data-Item)

Number of Words Per Entry in B0 Set (Data-Item)

Verification Values Set - B0

Keyword Value Verification Repeating Group

Distinct Value for Keyword (Data-Item)

B1 Parameter Set

Number of Entries in B1 Set (Data-Item)

Number of Words Per Entry in B1 Set (Data-Item)

Data Base Verification Set - B1

Verification Repeating Group

Repeating Group Level Indicator (Data-Item)

Length of Repeating Group (Data-Item)

Number of Repetitions of Repeating Group (Data-Item)

Location of First Repeating Group (Data-Item)

Value Use Code (Data-Item)

Null Use Code (Data-Item)

Null Value (Data-Item)

Minimum Value of Data-Item (Data-Item)

Maximum Value of Data-Item (Data-Item)

Location of Data-Item (Data-Item)

Length of Data-Item (Data-Item)

Type of Data-Item (Data-Item)

B2 Parameter Set

Number of Entries in B2 Set (Data-Item)

Number of Words Per Entry in B2 Set (Data-Item)

Non-OAG Flight Accession Pointer Set - B2

Operator Code Pointer Repeating Group

Non-OAG Operator Code (Data-Item)

Pointer to Flight Accession Range Value Set (Data-Item)

Number of Flight Accession Ranges (Data-Item)

B3 Parameter Set

Number of Entries in B3 Set (Data-Item)

Number of Words Per Entry in B3 Set (Data-Item)

Flight Accession Range Value Set - B3

Flight Accession Range Repeating Group

Flight Accession Range Values (Data-Item)

C0 Parameter Set

Number of Entries in C0 Set (Data-Item)

Number of Words Per Entry in C0 Set (Data-Item)

Interface Control Set - C0

Interface Control Repeating Group

Table ID (Data-Item)

Update Type (Data-Item)

List Indicator Flag (Data-Item)

List Output Flag (Data-Item)

Time Change Type (Data-Item)

Table No. (Data-Item)

Error Flag (Data-Item)

Input Data File Name (Data-Item)

Delete Table Flag (Data-Item)

Start/Restart Flag (Data-Item)

C1 Parameter Set

Number of Entries in C1 Set (Data-Item)

Number of Words Per Entry in C1 Set (Data-Item)

Input Data Description Set - C1

Data Description Repeating Group

Input Keyword (Data-Item)

Input Item Type (Data-Item)

Input Item Length (Data-Item)

Keyword Flag (Data-Item)

Card No. (Data-Item)

Starting Column (Data-Item)

C3 Parameter Set

Total Number of Bytes in C3 Set (Data-Item)

Number of Entries in C3 Set (Data-Item)

Number of Words Per Entry in C3 Set (Data-Item)

Sort Parameter Table Set - C3

Sort Parameter Repeating Group

Name of Field (Data-Item)

DDNAME Substitute Field (Data-Item)

Record Length (Data-Item)

Record Format (Data-Item)

Sort Key Starting Byte (Data-Item)

Sort Key Length (Data-Item)

Sort Key Type (Data-Item)

Sort Order (Data-Item)

C4 Parameter Set

Number of Entries in C4 Set (Data-Item)

Number of Words Per Entry in C4 Set (Data-Item)

Error Message Set - C4

Error Message Repeating Group

Error Code (Data-Item)

Error Severity (Data-Item)

Asterisk Position (Data-Item)

Card Buffer Entry No. (Data-Item)

C5 Parameter Set

Number of Entries in C5 Set (Data-Item)

Number of Words Per Entry in C5 Set (Data-Item)

Retrieved Data Record Set - C5

Data Record Repeating Group

Data Record Item (Data-Item)

C6 Parameter Set

Number of Entries in C6 Set (Data-Item)

Number of Words Per Entry in C6 Set (Data-Item)

Control Block Information Table Set - C6

DCB Information Repeating Group

Data Set Organization (Data-Item)

Record Format (Data-Item)

Maximum Block Size (Data-Item)

Logical Record Length (Data-Item)

Input/Output Buffer Address (Data-Item)

C7 Parameter Set

Number of Entries in C7 Set (Data-Item)

Number of Words Per Entry in C7 Set (Data-Item)

Flight Record Header Set - C7

Header Item Repeating Group

Data Set Identification (Data-Item)

Responsible Component (Data-Item)

Number of Blocks (Data-Item)

Total Number of Records (Data-Item)

Effective Date of Tape (Data-Item)

Effective Epoch Date of Tape (Data-Item)

Effective Date Day of Week (Data-Item)

Number of Records Discarded (Data-Item)

Number of Duplicate Records (Data-Item)

OAG End of File Flag (Data-Item)

H0 Parameter Set

Number of Entries in H0 Set (Data-Item)

Number of Words Per Entry in H0 Set (Data-Item)

Input Control Card Set - H0

Input Control Card Items Repeating Group

Control Card Item (Data-Item)

H1 Parameter Set

Number of Entries in H1 Set (Data-Item)

Number of Words Per Entry in H1 Set (Data-Item)

Input Data Card Set - H1

Input Data Card Items Repeating Group

Input Data Card Item (Data-Item)

H2 Parameter Set

Number of Entries in H2 Set (Data-Item)

Number of Words Per Entry in H2 Set (Data-Item)

Formatted Data Set - H2

Formatted Data Items Repeating Group

Formatted Data Item (Data-Item)

H3 Parameter Set

Number of Entries in H3 Set (Data-Item)

Number of Words Per Entry in H3 Set (Data-Item)

Intermediate Buffer Data Set - H3

Buffer Data Items Repeating Group

Data Record Item (Data-Item)

H5 Parameter Set

Number of Entries in H5 Set (Data-Item)

Number of Words Per Entry in H5 Set (Data-Item)

Output Print Line Information Set - H5

Print Line Information Repeating Group

Header Control Character (Data-Item)

Insert Text Flag (Data-Item)

Insert Text (Data-Item)

H6 Parameter Set

Number of Entries in H6 Set (Data-Item)

Number of Words Per Entry in H6 Set (Data-Item)

Retrieved/Formatted Data Record Set - H6

Data Record Items Repeating Group

Data Record Item (Data-Item)

H7 Parameter Set

Number of Entries in H7 Set (Data-Item)

Number of Words Per Entry in H7 Set (Data-Item)

OAG Input Data Set - H7

OAG Tape Input Record Items Repeating Group

OAG Record Item (Data-Item)

H8 Parameter Set

Number of Entries in H8 Set (Data-Item)

Number of Words Per Entry in H8 Set (Data-Item)

Output Header Set - H8

Output Header Items Repeating Group

Number of Lines in a Header (Data-Item)

Minimum Lines After Header (Data-Item)

Relative Location of Next Header (Data-Item)

Carriage Control Character (Data-Item)

Header Text Vector

Header Text Item (Data-Item)

H9 Parameter Set

Number of Entries in H9 Set (Data-Item)

Number of Words Per Entry in H9 Set (Data-Item)

Sort Buffer Set - H9

Formatted Record Items Repeating Group

Data Record Item (Data-Item)

DA Parameter Set - ZY

Aircraft Class Table Set (Data-Item)

Aircraft Type Table Set (Data-Item)

Airline Operator Table Set (Data-Item)

Airport Fix Table Set (Data-Item)

Airport Table Set (Data-Item)

Arrival Fix Table Set (Data-Item)

Center Table Set (Data-Item)

Continue Table Set (Data-Item)

Housekeeping Table Set (Data-Item)

Non-OAG Arriv/Dept Set (Data-Item)

Non-OAG Flight Access Set (Data-Item)

Non-OAG Flight Index Set (Data-Item)

Non-OAG Flight Record Set (Data-Item)

Non-OAG Name Table Set (Data-Item)

Normal Capacity Table Set (Data-Item)

Normal General Aviation Set (Data-Item)

OAG Arriv/Dept Set (Data-Item)

OAG Flight Accession Set (Data-Item)

OAG Flight Index Table Set (Data-Item)

OAG Flight Record Set (Data-Item)

Operational Category Set (Data-Item)

Output Device Table Set (Data-Item)

Output Format Table Set (Data-Item)

Parameter Table Set (Data-Item)

Table Mapping Table (Data-Item)

User-Supplied Capacity Set (Data-Item)

User-Supplied General Aviation Set (Data-Item)

Zone Table Set (Data-Item)

Non-OAG Housekeeping Table Set (Data-Item)

Error Message Transaction Set (Data-Item)

Aircraft Type Conversion Set (Data-Item)

Airline Operator Conversion Set (Data-Item)

Create Mode (Data-Item)

Update Mode (Data-Item)

Merge Mode (Data-Item)

List Mode (Data-Item)

Sortout File DDNAME (Data-Item)

Sortin File DDNAME (Data-Item)

Arrival Fix Keyword (Data-Item)

Airline Code Keyword (Data-Item)

Aircraft Type Keyword (Data-Item)

Airport Keyword (Data-Item)

Center Keyword (Data-Item)

Aircraft Class Keyword (Data-Item)

Operational Category Keyword (Data-Item)

Frequency Field Keyword (Data-Item)

Effective Date Keyword (Data-Item)

Discontinue Date Keyword (Data-Item)

Departure Date Mask Keyword (Data-Item)

Internal Code Keyword (Data-Item)

Deletion Indicator Keyword (Data-Item)

Pacing/Non-Pacing Keyword (Data-Item)

Gate Time Keyword (Data-Item)

Number of Val in Vector Keyword (Data-Item)

Activation/Deactivation Keyword (Data-Item)

Number of Repeating Group Keyword (Data-Item)

Length Keyword (Data-Item)

Arrival Airport Keyword (Data-Item)

Departure Airport Keyword (Data-Item)

Pacing Airport Keyword (Data-Item)

Non-Pacing Airport Keyword (Data-Item)

Actual Number of Centers Keyword (Data-Item)

Actual Number of Pacing Airports Keyword (Data-Item)

Airports Keyword (Data-Item)

Default Code Keyword (Data-Item)

Output Format ID Keyword (Data-Item)

Format Title Keyword (Data-Item)

Category Identifier Keyword (Data-Item)

Zone Key Keyword (Data-Item)

Transaction Error Code Keyword (Data-Item)

Message Length - Part 1 Keyword (Data-Item)

Message Length - Part 2 Keyword (Data-Item)

Error Message Text Keyword (Data-Item)

Output Format Title Keyword (Data-Item)

Number of Free Blocks Keyword (Data-Item)

Non-OAG Call Sign Keyword (Data-Item)

Table ID Keyword Keyword (Data-Item)

Block Number Keyword (Data-Item)

Upper Limit Keyword (Data-Item)

Aircraft ID Keyword (Data-Item)

Departure Time Keyword (Data-Item)

Flight Keyword (Data-Item)

En Route Keyword (Data-Item)

Number of Free Blocks Keyword (Data-Item)

Free Block PTR For HS/HK Set (Data-Item)

Number of Overflow Blocks (Data-Item)

Next Record Number in IX/XI Set (Data-Item)

DDNAME For OAG Header (Data-Item)

Sort DDNAME For OAG Input File (Data-Item)

Sort DDNAME For OAG Output File (Data-Item)

Flight Record Block Factor (Data-Item)

Activation/Deactivation Mask Init Value (Data-Item)

Maximum Byte-Formatted Buffer (Data-Item)

Number of DK Entries (Data-Item)

Maximum Line Count/Page (Data-Item)

Number of Seconds in 31 Days (Data-Item)

YA Parameter Set

Number of Entries in YA Set (Data-Item)

Number of Words Per Entry in YA Set (Data-Item)

DA Miscellaneous Items Set - YA

Mode of Operation (Data-Item)

DDNAME of Control Card (Data-Item)

List File (Data-Item)

DDNAME of Input Raw (Data-Item)

Data List File (Data-Item)

DDNAME of Data Base (Data-Item)

Record List File (Data-Item)

DDNAME of SPCX Error (Data-Item)

Message File (Data-Item)

DDNAME of Existing (Data-Item)

Data Base (Data-Item)

DK Set Index (Data-Item)

HDR Required Flag (Data-Item)

Last Page (Data-Item)

Maximum Linecount/Page (Data-Item)

Binary Month Value for OAG Tape Data (Data-Item)

Binary Day Value for OAG Tape Date (Data-Item)

Binary Year Value for OAG Tape Date (Data-Item)

Binary Month, Day, and Year Value for OAG (Data-Item)

Numeric OAG Tape Date in EBCDIC (Data-Item)

Processing Error Severity (Data-Item)

Day of Week of OAG (Data-Item)

Tape Effective Date (Data-Item)

Number of Vector Values (Data-Item)

Number of Repeating Group (Data-Item)

Present Number of Repeating Groups (Data-Item)

Length of Repeating Group in Bytes (Data-Item)

Position of NMBRPT (Data-Item)

Keyword Found Flag (Data-Item)

Pointer to New Record (Data-Item)

Number of Items in A2 (Data-Item)

A2 Starting Index (Data-Item)

A2 Index After (Data-Item)

Repeating Group Count (Data-Item)

A2 Table Index (Data-Item)

Pacing Indicator Offset (Data-Item)

Gate Time Offset (Data-Item)

Retrieval Key Flag (Data-Item)

Multiple Value Flag (Data-Item)

Length of Item (Data-Item)

Create Validation Flag (Data-Item)

Pointer to Old Record (Data-Item)

Error Message Code (Data-Item)

Error Message Code (Data-Item)

Repeating Group Flag (Data-Item)

A2 Item Type (Data-Item)

Position of NMBVAL (Data-Item)

Address of New Record (Data-Item)

Keyword Representing Item (Data-Item)

Unit Conversion Type (Data-Item)

Update Validation Flag (Data-Item)

Repeating Group Header Position (Data-Item)

Pointer to Change/Delete Buffer (Data-Item)

Address of Old Record (Data-Item)

C1 Table Index (Data-Item)

OAG Century/Year (Data-Item)

Pacing Indicator Length (Data-Item)

Center Value Length (Data-Item)

Number of Keyword Values (Data-Item)

Number of Items in Record (Data-Item)

A2 Item Word Location (Data-Item)

A2 Starting Location (Data-Item)

A2 Form Conversion (Data-Item)

A2 Input Flag (Data-Item)

A2 Output Flag (Data-Item)

RASCAN Parameter (Data-Item)

External Code (Data-Item)

Length of External Code (Data-Item)

Internal Code (Data-Item)

DARECD Error Flag (Data-Item)

Center Value Offset (Data-Item)

OAG Equipment Type Field Pointer (Data-Item)

OAG Carrier Service Pointer (Data-Item)

Control Card Error Lines (Data-Item)

Input Data Error Lines (Data-Item)

OAG Leave Time Field Pointer (Data-Item)

OAG Arrive Time Field Pointer (Data-Item)

OAG Date in Epoch Time (Data-Item)

Number of Card With Error (Data-Item)

Index of Error in Card (Data-Item)

DACONV Seconds Value (Data-Item)

DACONV Minutes Value (Data-Item)

DACONV Hours Value (Data-Item)

C0 Table Index (Data-Item)

DCB Pointer for SYSIN (Data-Item)

DCBPTR for YACNTD (Data-Item)

DCB PTR for YADBLD (Data-Item)

DCB PTR for YAINPD (Data-Item)

Term Card Found Flag (Data-Item)

Error Number (Data-Item)

List Type Flag (Data-Item)

Table ID (Data-Item)

DB List Error Lines (Data-Item)

Sort Error Flag (Data-Item)

Last Address of Scan (Data-Item)

Vector Fixed Length (Data-Item)

Maximum Number of Repeating Groups (Data-Item)

DAGECR TZ-Create Flag (Data-Item)

Pointer to OAG Date Field (Data-Item)

DCB Pointer for Sortout (Data-Item)

DCB Pointer for Sortin (Data-Item)

Field Length of Item (Data-Item)

Output List Found Flag (Data-Item)

C4 Table Index (Data-Item)

DCB Pointer for Raw Data (Data-Item)

TZ Set Core Address (Data-Item)

Call DBSTUP Flag-DAGCCP (Data-Item)

Old Retrieval Key Value (Data-Item)

Retrieval Key Length (Data-Item)

Record Length (Data-Item)

Gate Time Length (Data-Item)

Index in Formatted Set (Data-Item)

Print Line Start Column (Data-Item)

Update Retrieval Key (Data-Item)

Control Card Page Count (Data-Item)

Raw Data Page Count (Data-Item)

Data Set Page Count (Data-Item)

List All Tables Flag (Data-Item)

OAG Operator Offset (Data-Item)

OAG Operator Length (Data-Item)

A0 Table Index (Data-Item)

Relative Record Number (Data-Item)

Number of Free Blocks (Data-Item)

DALCNT Indicator (Data-Item)

Next Item Expected Flag (Data-Item)

DALCNT Current Card Number (Data-Item)

DALCNT Current Card Index (Data-Item)

DAPRCC H0 Buffer Pointer (Data-Item)

DALCNT Keyword C1 Index (Data-Item)

DALCNT Keyword Found Index (Data-Item)

DALCNT Discard Flag (Data-Item)

DALCNT List Control Flag (Data-Item)

DAPRCO H0 Byte Index (Data-Item)

DAPRCO Flag (Data-Item)

DCBPTR For OAG Input (Data-Item)

DCBPTR For OAG Output (Data-Item)

DCBPTR For OAG Header (Data-Item)

3.3.3.2 Data Reduction and Analysis (RA) Component Data.

and Analysis (RA) Component sets in alphabetical order by English language set name:

ALQ File Record Type Verification Table Set	L0
ALQ Record Table Set	I9
ALQ Tape DDnames Vector	I3
Asterisk Print Positions Vector	I0
Common Sort Information Table Set	K4
Control Card Buffer Table Set	I4
Data Base Statistics Record Table Set	L7
Data Set Lock Count Table Set	L6
Filter Control Table Set	I5
Flight Record Buffer Table Set	L8
Flight Record Compare Control Table Set	L9
Flight Record Totals Table Set	L5
Frequency Count Table Set	K0
Heading Line Table Set	K5
Keywords/Delimiters Table Set	BH
Logcomp Summary Heading Table Set	K9
Logcomp Summary Statistic Table Set	K3
Message Inserts Positions Vector	I2
Message Inserts Vector	I1
Message Source ID Table Set	KX

Miscellaneous Items Table Set	VY
MSGTYP Verification Table Set	I7
Place Verification Table Set	I7P
Print Line Table Set	I8
Program Element ID Vector	KW
RA Parameter Set	ZR
Recording Code Table Set	KU
Report Control Table Set	I6
Report Keywords Table Set	K8
Report Name Table Set	K6
SAR Data Record Header Table Set	KV
SARDUMP File Information Table Set	KT
SAR Dump Translate Table Set	L2
SAR Tape Header Hold Area Table Set	L4
SAR Tape Heading Line Table Set	L1
SAR Tape Print Lines Table Set	L3
Scratch Data Set Information Table Set	K2
Sort Parameter Table Set	K7
Source Verification Table Set	I7S
Statistics Table Set	K1
Time Vector	BG

Data Reduction and Analysis (RA) Component sets in alphabetical order by symbolic set name:

BG, BH, I0, I1, I2, I3, I4, I5, I6, I7, I7P, I7S, I8, I9, K0, K1, K2, K3, K4, K5, K6, K7, K8, K9, KT, KU, KV, KW, KX, L0, L1, L2, L3, L4, L5, L6, L7, L8, L9, VY, YR, ZR.

YR Parameter Set

Number of Entries in YR Table (Data-Item)

Number of Words Per Entry in YR Table (Data-Item)

Common Miscellaneous Items Table Set - YR

Verification Table Size (Data-Item)

Control Card Column Number (Data-Item)

Control Card Number (Data-Item)

Length of Identified Field (Data-Item)

Identified Field (Data-Item)

Table Entry Number of Field (Data-Item)

Data Type Indicator (Data-Item)

Error Message Code (Data-Item)

Error Return Code (Data-Item)

Error File DCB Address (Data-Item)

Print File DCB Address (Data-Item)

Time in Seconds Set - BG

Time Vector

Time (Data-Item)

Asterisk Position Set - I0

Asterisk Position Vector

Asterisk Position (Data-Item)

Message Inserts Set - I1

Message Inserts Vector

Message Insert (Data-Item)

Message Inserts Position Set - I2

Inserts Position Vector

Insert Position (Data-Item)

BH Parameter Set

Number of Entries in BH Table (Data-Item)

Number of Words Per Entry in BH Table (Data-Item)

Keywords/Delimiters Table Set - BH

Keywords/Delimiters Vector

Keywords/Delimiters (Data-Item)

RA-SPCX
ARRAY I3
SEGMENT DRC003

ALQ Tape DDNAMEs Set - I3

ALQ Tape DDNAMEs Vector

DDNAMEs (Data-Item)

I4 Parameter Set

Number of Entries in I4 Table (Data-Item)

Number of Words Per Entry in I4 Table (Data-Item)

Control Card Buffer Table Set - I4

Control Card Repeating Group

Control Card Image Vector

Control Card Image (Data-Item)

I5 Parameter Set

Number of Entries in I5 Table (Data-Item)

Number of Words Per Entry in I5 Table (Data-Item)

Filter Control Table Set - I5

Filter Item Repeating Group

Filter Keyword (Data-Item)

Filter Criteria Flag (Data-Item)

Maximum Table Entry Size (Data-Item)

Exclude Identifiers Indicator (Data-Item)

Number of Table Entries (Data-Item)

I6 Parameter Set

Number of Entries in I6 Table (Data-Item)

Number of Words Per Entry in I6 Table (Data-Item)

Report Control Table Set - I6

Report Name (Data-Item)

First Input File DDNAME (Data-Item)

First Input File DCB Address (Data-Item)

Second Input File DDNAME (Data-Item)

Second Input File DCB Address (Data-Item)

Output File DCB Address (Data-Item)

Report Time Interval--HHMMSS (Data-Item)

Report Time Interval--Seconds (Data-Item)

Report Beginning Time--HHMMSS (Data-Item)

Report Beginning Date--MMDDYY (Data-Item)

Report Ending Time--HHMMSS (Data-Item)

Report Ending Date--MMDDYY (Data-Item)

Report Beginning Epoch Time (Data-Item)

Report Ending Epoch Time (Data-Item)

Report Start Interval--HHMMSS (Data-Item)

Report Start Interval--Seconds (Data-Item)

First Sort Field Parameter Name (Data-Item)

Displacement to First Sort Field (Data-Item)

Length of First Sort Field (Data-Item)

Data Type of First Sort Field (Data-Item)

Ascend/Descend Sort Key (Data-Item)

Second Sort Field Parameter Name (Data-Item)

Displacement To Second Sort Field (Data-Item)

Length of Second Sort Field (Data-Item)

Data Type of Second Sort Field (Data-Item)

Ascend/Descend Sort Key (Data-Item)

OAG1 Sorted File DDNAME (Data-Item)

OAG1 Sorted File DCB Address (Data-Item)

OAG2 Sorted File DDNAME (Data-Item)

OAG2 Sorted File DCB Address (Data-Item)

Non-OAG1 Sorted File DDNAME (Data-Item)

Non-OAG1 Sorted File DCB Address (Data-Item)

Non-OAG2 Sorted File DDNAME (Data-Item)

Non-OAG2 Sorted File DCB Address (Data-Item)

I7 Parameter Set

Number of Entries in I7 Table (Data-Item)

Number of Words Per Entry in I7 Table (Data-Item)

MSGTYP Verification Table Set - I7

Verification Table Entry Vector

Table Entry (Data-Item)

Place Verification Table Set - I7P

Verification Table Entry Vector

Table Entry (Data-Item)

Source Verification Table Set - I7S

Verification Table Entry Vector

Table Entry (Data-Item)

K0 Parameter Set

Number of Entries in K0 Table (Data-Item)

Number of Words Per Entry in K0 Table (Data-Item)

Frequency Count Table Set - K0

Time Information Repeating Group

Lower Time Limit (Data-Item)

Upper Time Limit (Data-Item)

Accumulator (Data-Item)

K1 Parameter Set

Number of Bytes in K1 Table (Data-Item)

Number of Entries in K1 Table (Data-Item)

Number of Words Per Entry in K1 Table (Data-Item)

Statistics Table Set - K1

Minimum Value (Data-Item)

Maximum Value (Data-Item)

Sum of Values (Data-Item)

Sum of Values Squared (Data-Item)

Mean of Values (Data-Item)

Standard Deviation of Values (Data-Item)

Response Pairs Not Used (Data-Item)

Number of Times Module Called (Data-Item)

K2 Parameter Set

Number of Bytes in K2 Table (Data-Item)

Number of Entries in K2 Table (Data-Item)

Number of Words Per Entry in K2 Table (Data-Item)

Scratch Data Set Information Table Set - K2

Relative Block Number for File 1 (Data-Item)

Relative Block Number for File 2 (Data-Item)

End Block Number for File 1 (Data-Item)

End Block Number for File 2 (Data-Item)

K3 Parameter Set

Number of Bytes in K3 Table (Data-Item)

Number of Entries in K3 Table (Data-Item)

Number of Words Per Entry in K3 Table (Data-Item)

LOGCOMP Summary Statistic Table Set - K3

Total Records ALQ1 (Data-Item)

Total Records ALQ2 (Data-Item)

Total Matched Records (Data-Item)

Total Mismatched Records (Data-Item)

Total No-Match ALQ1 Records (Data-Item)

Total No-Match ALQ2 Records (Data-Item)

K6 Parameter Set

Number of Entries in K6 Table (Data-Item)

Number of Words Per Entry in K6 Table (Data-Item)

Report Name Table Set - K6

Report Repeating Group

Report Name (Data-Item)

Number of Input Files for Report (Data-Item)

Module to Produce Report (Data-Item)

K7 Parameter Set

Number of Entries in K7 Table (Data-Item)

Number of Words Per Entry in K7 Table (Data-Item)

Sort Parameter Table Set - K7

Sort Parameters Repeating Group

Name of Sort Field (Data-Item)

Displacement to Sort Field (Data-Item)

Length of Sort Field (Data-Item)

Type of Data (Data-Item)

K8 Parameter Set

Number of Entries in K8 Table (Data-Item)

Number of Words Per Entry in K8 Table (Data-Item)

Report Keywords Table Set - K8

Report Keyword Repeating Group

Valid Keyword (Data-Item)

Location for Storing Keyword (Data-Item)

K9 Parameter Set

Number of Entries in K9 Table (Data-Item)

Number of Words Per Entry in K9 Table (Data-Item)

LOGCOMP Summary Heading Table Set - K9

Summary Heading Repeating Group

First 8 Characters of Heading (Data-Item)

Second 8 Characters of Heading (Data-Item)

Third 8 Characters of Heading (Data-Item)

Fourth 8 Characters of Heading (Data-Item)

Fifth 8 Characters of Heading (Data-Item)

VY Parameter Set

Number of Entries in VY Table (Data-Item)

Number of Words Per Entry in VY Table (Data-Item)

Miscellaneous Items Table Set - VY

Read From Scratch Data Set Flag (Data-Item)

Input ALQ Tape DCB Address (Data-Item)

Filtered ALQ Tape DCB Address (Data-Item)

Output Device Mask (Data-Item)

Expected Value Type (Data-Item)

Input/Output Error Indicator (Data-Item)

Control Card Error Indicator (Data-Item)

Record Acceptance Flag (Data-Item)

CNTLST/ERRIN Failure Indicator (Data-Item)

Report Control Cards DCB Address (Data-Item)

Report to be Done by RADBA Indicator (Data-Item)

Good Control Card Found Indicator (Data-Item)

End-of-File Flag on ALQ1 (Data-Item)

End-of-File Flag on ALQ2 (Data-Item)

Read ALQ1 Flag (Data-Item)

Read ALQ2 Flag (Data-Item)

Record Flag for ALQ1 (Data-Item)

Record Flag for ALQ2 (Data-Item)

Global Error Indicator (Data-Item)

Line Count (Data-Item)

Page Count (Data-Item)

First Time Flag for RASMHD (Data-Item)

First Time Flag for RAFCA (Data-Item)

Selection Missed Flag (Data-Item)

Too Many Bins Flag (Data-Item)

ALQ Buffer Address (Data-Item)

Number of Files Required by Report (Data-Item)

Selection One Field (Data-Item)

Selection Two Field (Data-Item)

Scratch Data Set DDNAME (Data-Item)

Response Time (Data-Item)

DCB Address of Scratch Data Set (Data-Item)

Current Lower Report Interval (Data-Item)

Current High Report Interval (Data-Item)

Printable Form--VYSF1 (Data-Item)

Printable Form--VYSF1 Continued (Data-Item)

Printable Form--VYSF2 (Data-Item)

Printable Form--VYSF2 Continued (Data-Item)

SAR Record Block Number (Data-Item)

SAR Record Buffer Address (Data-Item)

SAR Continuation Indicator (Data-Item)

SAR Partial Printline Indicator (Data-Item)

SAR Control Card Error Flag (Data-Item)

Recording Code Table Overflow Indicator (Data-Item)

SAR Module Name for I/O Error Message (Data-Item)

SAR File DDNAME for I/O Error Message (Data-Item)

Recording Code of Current SAR Record (Data-Item)

Length of Current SAR Record (Data-Item)

PEID of Current SAR Record (Data-Item)

Time of Current SAR Record (Data-Item)

Half Second Time of Current SAR Record (Data-Item)

SAR Record Status (Data-Item)

RASCAN Return Error (Data-Item)

Flight Record Total (Data-Item)

Overflow Block Total (Data-Item)

Primary Block Total (Data-Item)

Selection Field Three (Data-Item)

Printable Form--VYSF3 (Data-Item)

Printable Form--VYSF3 Continued (Data-Item)

Inspection Indicator (Data-Item)

Inspection Percentage (Data-Item)

K4 Parameter Set

Number of Entries in K4 Table (Data-Item)

Number of Words Per Entry in K4 Table (Data-Item)

Common Sort Information Table Set - K4

Sort Repeating Group

Name of Sort Field (Data-Item)

Sort DDNAME (Data-Item)

Record Length (Data-Item)

Sort Field Starting Byte (Data-Item)

Length of Sort Field (Data-Item)

Data Type of Sort Field (Data-Item)

Ascend/Descend Indicator (Data-Item)

I9 Parameter Set

Number of Entries in I9 Table (Data-Item)

Number of Words Per Entry in I9 Table (Data-Item)

ALQ Record Table Set - I9

Source Logical Device Number (Data-Item)

Destination Logical Device Number (Data-Item)

Message Type (Data-Item)

Airport/Center Identification (Data-Item)

Header Length (Data-Item)

Message ID (Data-Item)

Enhanced Message Address (Data-Item)

Transaction Property Block Address (Data-Item)

Message Source Logical Device Number (Data-Item)

Spool Address (Data-Item)

Output Device Block Address (Data-Item)

Record Type (Data-Item)

TCC Options (Data-Item)

Output Device Mask (Data-Item)

Process ID (Data-Item)

Epoch Entry Time (Data-Item)

Greenwich Entry Time (Data-Item)

Greenwich Entry Date (Data-Item)

Epoch Log/Spool Time (Data-Item)

Greenwich Log/Spool Time (Data-Item)

Greenwich Log/Spool Date (Data-Item)

Simulation ID (Data-Item)

Message Text Length (Data-Item)

Message Text Vector

    Message Text (Data-Item)

L6 Parameter Set

Number of Entries in L6 Table (Data-Item)

Number of Words in L6 Table (Data-Item)

Data Set Lock Count Table Set - L6

Lock Repeating Group

Lower Time Limit (Data-Item)

Upper Time Limit (Data-Item)

Total Accesses (Data-Item)

Locks Initiated (Data-Item)

Locks Released (Data-Item)

Instantaneous Time (Data-Item)

Locks on at Instantaneous Time (Data-Item)

K5 Parameter Set

Number of Entries in K5 Table (Data-Item)

Number of Words Per Entry in K5 Table (Data-Item)

Heading Line Table Set - K5

Header Line Repeating Group

Header Line - Section One (Data-Item)

Header Line - Section Two (Data-Item)

Version ID (Data-Item)

Header Line - Section Three (Data-Item)

Header Line - Section Four (Data-Item)

Header Line - Section Five (Data-Item)

Header Line - Section Six (Data-Item)

Header Line - Section Seven (Data-Item)

Header Line - Section Eight (Data-Item)

Report Type (Data-Item)

Header Line - Section Nine (Data-Item)

Header Line - Section Ten (Data-Item)

Header Line - Section Eleven (Data-Item)

Header Line - Section Twelve (Data-Item)

Header Line - Section Thirteen (Data-Item)

Header Line - Section Fourteen (Data-Item)

Header Line - Section Fifteen (Data-Item)

Header Line - Section Sixteen (Data-Item)

I8 Parameter Set

Number of Entries in I8 Table (Data-Item)

Number of Words Per Entry in I8 Table (Data-Item)

Print Line Table Set - I8

Report Line Repeating Group

Carriage Control (Data-Item)

Print Line - Section One (Data-Item)

Print Line - Section Two (Data-Item)

Print Line - Section Three (Data-Item)

Print Line - Section Four (Data-Item)

Print Line - Section Five (Data-Item)

Print Line - Section Six (Data-Item)

Print Line - Section Seven (Data-Item)

Print Line - Section Eight (Data-Item)

Print Line - Section Nine (Data-Item)

Print Line - Section Ten (Data-Item)

Print Line - Section Eleven (Data-Item)

Print Line - Section Twelve (Data-Item)

Print Line - Section Thirteen (Data-Item)

Print Line - Section Fourteen (Data-Item)

Print Line - Section Fifteen (Data-Item)

Print Line - Section Sixteen (Data-Item)

Print Line - Section Seventeen (Data-Item)

RA Parameter Set - ZR

(Segment DRC001)

Verification Fail Value (Data-Item)

(Segment DRC021)

Current Version Number (Data-Item)

Print Position for Page Count (Data-Item)

Index to First Header Line in K5 Table (Data-Item)

Index to Second Header Line in K5 Table (Data-Item)

Index to Third Header Line in K5 Table (Data-Item)

Index to Fourth Header Line in K5 Table (Data-Item)

Index to Secondary Header Line in K5 Table (Data-Item)

LOGCOMP Max to Read After EOF on One ALQ (Data-Item)

Sort Heading Print Position (Data-Item)

Print Position for Sort Field 1 (Data-Item)

Print Position for A/D Indicator (Data-Item)

Print Position for Sort Field2 (Data-Item)

Print Position for Second A/D Indicator (Data-Item)

Print Position for Time Interval Header (Data-Item)

Print Position for Time Value (Data-Item)

Print Position for Report Interval Header (Data-Item)

Print Position for Report Interval Value (Data-Item)

Print Position for Time Span Header (Data-Item)

Print Position for Time Span Beginning Time (Data-Item)

Print Position for Time Span Beginning Date (Data-Item)

Print Position for Time Span Hyphen (Data-Item)

Print Position for Time Span Ending Time (Data-Item)

Print Position for Time Span Ending Date (Data-Item)

Print Position for RTSUM Sort Name 1 (Data-Item)

Print Position for RTSUM Equals (=) Sign (Data-Item)

Print Position for RTSUM Sort Field1 (Data-Item)

Print Position for RTSUM Sort Name 2 (Data-Item)

Print Position for Second RTSUM Equals (=) Sign (Data-Item)

Print Position for Sort Field2 (Data-Item)

Print Position for RTSUM Report Interval Header (Data-Item)

Print Position for RTSUM Report Interval Beginning Time (Data-Item)

Print Position for RTSUM Report Interval Beginning Date (Data-Item)

Print Position for RTSUM Report Interval Hyphen (Data-Item)

Print Position for RTSUM Report Interval Ending Time (Data-Item)

Print Position for RTSUM Report Interval Ending Date (Data-Item)

Print Position for RTSUM Summary Count (Data-Item)

Print Position for RTSUM Mean Value (Data-Item)

Print Position for RTSUM Minimum Value (Data-Item)

Print Position for RTSUM Maximum Value (Data-Item)

Print Position for RTSUM Standard Deviation (Data-Item)

Print Position for RTSUM Sum Value (Data-Item)

Print Position for Message ID (Data-Item)

Print Position for Message Type (Data-Item)

Print Position for Message Source (Data-Item)

Print Position for Message Destination (Data-Item)

Print Position for Message Entry Time (Data-Item)

Print Position for Message Entry Date (Data-Item)

Print Position for Message Spool Time (Data-Item)

Print Position for Message Spool Date (Data-Item)

Print Position for IOSTAT Total Messages Value (Data-Item)

Print Position for IOSTAT Average Message Rate Value (Data-Item)

Print Position for IOSTAT Minimum Value (Data-Item)

Print Position for IOSTAT Maximum Value (Data-Item)

Print Position for IOSTAT Standard Deviation (Data-Item)

Maximum Lines Per Page (Data-Item)

Epoch Start Date (Data-Item)

RTSUM Summary Statistics Line Index (Data-Item)

Message Header Index (Data-Item)

IOSUM Statistics Line Index (Data-Item)

LOGCOMP Header Print Position (Data-Item)

Print Position for LOGCOMP Count (Data-Item)

Field of Blanks (Data-Item)

Flag Value One (Data-Item)

Flag Value Two (Data-Item)

Initial Status (Data-Item)

Print SAR Segment and Trailer Flag Value (Data-Item)

Print SAR Segment Flag Value (Data-Item)

Print Partial Record Flag Value (Data-Item)

Format Control Card Header Flag Value (Data-Item)

Format Tape Dump Header Flag Value (Data-Item)

SAR Index for Read/Write Errors (Data-Item)

SAR Index for Control Card Errors (Data-Item,

SAR Index for Error Message I/O Errors (Data-Item)

SAR Index for I/O Errors (Data-Item)

SAR Index for Block Descriptor Errors (Data-Item)

SAR Index for Open Errors (Data-Item)

SAR Index for Close Errors (Data-Item)

SAR Index for Abort Errors (Data-Item)

SAR Abort Default Indicator (Data-Item)

DDNAME of Reformat File (Data-Item)

KX Parameter Set

Number of Entries in KX Table (Data-Item)

Number of Words Per Entry in KX Table (Data-Item)

Message Source ID Table Set - KX

Message Item Repeating Group

Control Card Message Source ID (Data-Item)

Source ID Logical Device Number (Data-Item)

Default Output Device Mask (Data-Item)

KT Parameter Set

Number of Entries in KT Table (Data-Item)

Number of Words Per Entry in KT Table (Data-Item)

SARDUMP File Information Table Set - KT

Multiple Item Repeating Group

SARDMP DDNAME (Data-Item)

DCB Buffer Address (Data-Item)

Length of Record (Data-Item)

Input/Output File Flag (Data-Item)

Data Set Organization Indicator (Data-Item)

KT Index Set

Index to KT Table for SYSIN (Data-Item)

Index to KT Table for Report File (Data-Item)

Index to KT Table for SAR Tape (Data-Item)

Index to KT Table for Error Message File (Data-Item)

L1 Parameter Set

Number of Entries in L1 Table (Data-Item)

Number of Words/Entry in L1 Table (Data-Item)

SAR Tape Heading Line Table Set - L1

Print Line Vector

Print Position (Data-Item)

L2 Parameter Set

Number of Entries in L2 Table (Data-Item)

Number of Words Per Entry in L2 Table (Data-Item)

SAR Dump Translate Table Set - L2

Translate Item 1 (Data-Item)

Translate Item 2 (Data-Item)

L3 Parameter Set

Number of Entries in L3 Table (Data-Item)

Number of Words Per Entry in L3 Table (Data-Item)

SAR Tape Print Lines Table Set - L3

Print Line 1 Vector

Print Line Text (Data-Item)

Print Line 2 Vector

Print Line Text (Data-Item)

Trailer Print Line Vector

Print Line Text (Data-Item)

L4 Parameter Set

Number of Entries in L4 Table (Data-Item)

Number of Words Per Entry in L4 Table (Data-Item)

SAR Tape Header Hold Area Table Set - L4

System Resident CE Unit ID (Data-Item)

Number of Logical SE (Data-Item)

System Origin (Data-Item)

SIM Tape ID (Data-Item)

Day-Month-Year Tape Create Date (Data-Item)

Reel Number (Data-Item)

Time Since Midnight (Data-Item)

ARTCC ID (Data-Item)

Active SAR Category (Data-Item)

L0 Parameter Set

Number of Entries in L0 Table (Data-Item)

Number of Words Per Entry in L0 Table (Data-Item)

Selected Record Type (Data-Item)

ALQ File Record Type Verification Table Set - L0

Valid Record Type Vector

Valid Type (Data-Item)

KU Parameter Set

Minimum Value of Input Recording Code (Data-Item)

Maximum Value of Input Recording Code (Data-Item)

Dummy Index to PE ID Array (Data-Item)

Index to Table for Timing Analysis Records (Data-Item)

Number of Entries in KU Table (Data-Item)

Number of Words Per Entry in KU Table (Data-Item)

Recording Code Table Set - KU

SAR Item Repeating Group

Index to PE ID Array (Data-Item)

Total of Records Selected/Recording Code (Data-Item)

KV Parameter Set

Number of Entries in KV Table (Data-Item)

Number of Words Per Entry in KV Table (Data-Item)

SAR Data Record Header Table Set - KV

Type of SAR Segment (Data-Item)

Time of Segment (Data-Item)

Recording Code (Data-Item)

Type of Data (Data-Item)

PE ID in Segment (Data-Item)

KW Parameter Set

Number of Half Words Per Entry in KW (Data-Item)

Number of Entries in KW (Data-Item)

Number of Program Element IDs (Data-Item)

Program Element ID Set - KW

Program Element ID Vector

Program Element ID (Data-Item)

L9 Parameter Set

Number of Entries in L9 Table (Data-Item)

Number of Words Per Entry in L9 Table (Data-Item)

Flight Record Compare Control Table Set - L9

DDNAME Flight Record Set 1 (Data-Item)

DDNAME Flight Record Set 2 (Data-Item)

Record, Set 1, Buffer Address (Data-Item)

Record, Set 2, Buffer Address (Data-Item)

Match Indicator (Data-Item)

Address of Record in Error (Data-Item)

Miss or No Match Indicator (Data-Item)

OAG/Non-OAG Set Pointer (Data-Item)

Length in Words of Record (Data-Item)

Byte Displacement of Mismatch Field (Data-Item)

Length of Mismatch Field (Data-Item)

Total Number of Set 1 Records (Data-Item)

Total Number of Set 2 Records (Data-Item)

DDNAME of Set in Error (Data-Item)

Total Number of Mismatches (Data-Item)

Total Number of No Matches Set 1 (Data-Item)

Total Number of No Matches Set 2 (Data-Item)

Error Code (Data-Item)

Number of Words in Flight Record (Data-Item)

DCB Address of Set 1 (Data-Item)

DCB Address of Set 2 (Data-Item)

L5 Parameter Set

Number of Bytes in L5 Table (Data-Item)

Number of Entries in L5 Table (Data-Item)

Number of Words Per Entry in L5 Table (Data-Item)

Flight Record Totals Table Set - L5

Arrival Terminal External Code (Data-Item)

Departure Terminal External Code (Data-Item)

Arrival Terminal Internal Code (Data-Item)

Departure Terminal Internal Code (Data-Item)

Total Flights (Data-Item)

Overflow Block Indicator (Data-Item)

L8 Parameter Set

Number of Bytes in L8 Table (Data-Item)

Number of Entries in L8 Table (Data-Item)

Number of Words Per Entry in L8 Table (Data-Item)

Flight Record Buffer Table Set - L8

Flight Record Vector

Flight Record Data (Data-Item)

L7 Parameter Set

Number of Entries in L7 Table (Data-Item)

Number of Words Per Entry in L7 Table (Data-Item)

Data Base Statistics Record Table Set - L7

Type of Data Base Call (Data-Item)

Retrieval Method (Data-Item)

Data Set Accessed (Data-Item)

Address of Block (Data-Item)

Lock Level (Data-Item)

Start Lock Time (Data-Item)

Stop Lock Time (Data-Item)

3.3.3.3 Online Test Director (TA) Component Data. Online Test Director (TA) Component Sets in alphabetical order by English language set name:

Control Data Table	R6
Message Invalidation Table	R2
Message Output Arrays	R9, R8
Message Type Statistics Table	R5
Select/Delete Message Type Table	R1
Simulation Initialization Table	R0
TA Control Keyword Table	R7
TA Global Miscellaneous Item Table	UA
TA Local Miscellaneous Item Table	ZU
TA Valid Enroute Messages Table	UD
Total Statistics Table	R4
Write Message Table	R3

Online Test Director (TA) Component sets in alphabetical order by symbolic set name:

R0, R1, R2, R3, R4, R5, R6, R7, R9, R8, UA, UD, ZU

TA Control Keyword Table - R7

TA Control Keyword Vector

TA Control Keyword (Data-Item)

Total Statistics Table - R4

Total Statistic Literal (Data-Item)

Total Tape Transmissions (Data-Item)

Total Keyboard Transmissions (Data-Item)

Total Received - Accepted from AP (Data-Item)

Total Received - Rejected from AP (Data-Item)

Total Invalid ID (Data-Item)

Write Message Table - R3

Print Transmitted Messages (Data-Item)

Print Received Message (Data-Item)

Display Transmitted Messages (Data-Item)

Display Received Messages (Data-Item)

Simulation Initealigation Table - R0

Batch or Active Mode

Begin Execution Time in Binary Seconds (Data-Item)

Simulation Start Time Relative to Zero (Data-Item)

Simulation Length Relative to Zero (Data-Item)

Simulation Tape ID (Data-Item)

TA Global Miscellaneous Item Table - UA

Speed-Up Factor (%)(Data-Item)

Terminate Processing Flag (Data-Item)

Transmission Time (Data-Item)

Initialize COMPOOL Flag (Data-Item)

Time Range Flag (Data-Item)

Type of Data Flag (Data-Item)

Keyword Indicator (Data-Item)

First Table Entry Flag (Data-Item)

Table Entry Index (Data-Item)

First Table Entry Flag (Data-Item)

Transmit Message Flag (Data-Item)

Data Sequence Status (Data-Item)

Processing Flag - TATRAN (Data-Item)

Transmission Time (Data-Item)

Message Type ID (Data-Item)

Binary Transmission Time (Data-Item)

EBCDIC Tape Transmission Time (Binary) (Data-Item)

Previous Tape Transmission Time (Binary)(Data-Item)

Data Entry Number (Data-Item)

Entry Byte Position (Data-Item)

Message Type ID for TARECV (Data-Item)

First Message Entry Flag (Data-Item)

Entry Byte Position (Data-Item)

CFC Message Length (Data-Item)

TA Local Miscellaneous Item Table - ZU

Load Module Name - TAGSIT (Data-Item)

Load Module Name - TASIZT (Data-Item)

Load Module Name - TASDMT (Data-Item)

Load Module Name - TAMSIT (Data-Item)

Load Module Name - TAWMST (Data-Item)

Load Module Name - TASTAT (Data-Item)

Load Module Name - TAEXEC (Data-Item)

Load Module Name - TATRAN (Data-Item)

Load Module Name - TARECV (Data-Item)

Load Module Name - TASMBF (Data-Item)

Printer Device Name (Data-Item)

Tape Device Name (Data-Item)

Keyboard Device Name (Data-Item)

Message Header Length (Data-Item)

Monitor Header Length (Data-Item)

CSI Input Processor (Data-Item)

R5 Parameter Set

Number of Entries in Message Type Table (Data-Item)

Number of Bytes Per Entry (Data-Item)

Message Type Statistics Table - R5

Message Type Statistics Repeating Group

Message ID (Data-Item)

Tape Transmissions (Data-Item)

Keyboard Transmissions (Data-Item)

Received - Accepted from AP (Data-Item)

Received - Rejected from AP (Data-Item)

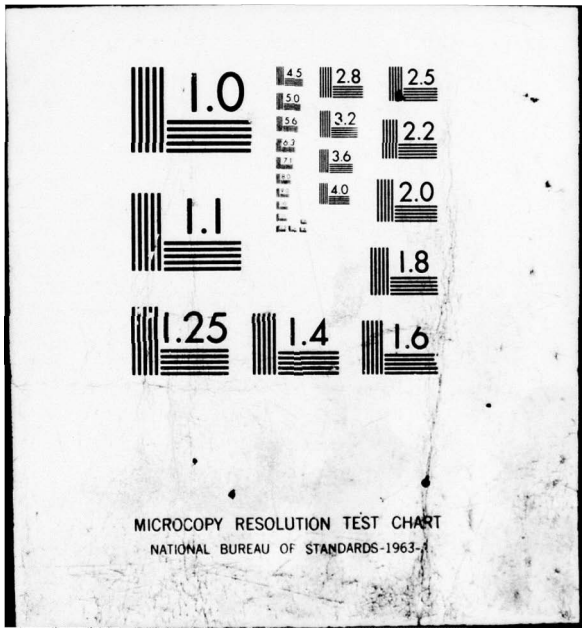
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5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

R2 Parameter Set

First Byte of Message Text (Data-Item)

Length of Entry in Bytes (Data-Item)

Message Invalidation Table - R2

Message Invalidation Repeating Group

Active or Available Entry (Data-Item)

Garble Message Transmission Time (Data-Item)

Message Byte Count (Data-Item)

Message ID (Data-Item)

End-of-Block (Data-Item)

Keyboard Message Array - R8

Keyboard Message Vector

Message Character (Data-Item)

Message Output Array - R9

Message Output Vector

Message Character (Data-Item).

Select/Delete Message Type Table - R1

Message Type Vector

Message types (Data-Item)

R6 Parameter Set

Length of Control Data Entry (Data-Item)

Control Data Entry Table - R6

Type of Input (Data-Item)

3.3.3.4 Test Case Generator (TR) Component Data

Test Case Generator (TR) Component sets in alphabetical order by English language set name:

CREATE Mode Message Selection Set	MO
Keyword Parameter Set	KY
Merge Mode Selection Set #1	M3
Merge Mode Selection Set #2	M4
Print Mode Selection Set	M5
Test Case Generator Parameter Set	ZY
User Control Card Information Set	UR

Test Case Generator Component sets in alphabetical order by set acronym name:

KY, MO, M3, M4, M5, UR, ZY.

User Control Card Information Set - UR

Function to be Performed (Data-Item)

Tape Header Record ID (Data-Item)

Simulation Start Time (Data-Item)

Simulation Length Time (Data-Item)

Control Card Output File (Data-Item)

Input Error File (Data-Item)

Input Data File (Data-Item)

Tape Output Data File (Data-Item)

Input Data Listing Print File (Data-Item)

Sim Tape Listing Output File (Data-Item)

Sort Sim Tape For Listing Option (Data-Item)

Verify Message Text Option (Data-Item)

Tape Input Data File 1 (Data-Item)

Tape Input Data File 2 (Data-Item)

Merge Sel/Del Recd Option-Tape 1 (Data-Item)

Merge Sel/Del Recd Option-Tape 2 (Data-Item)

Print Sel/Del Recd Option (Data-Item)

I/O Status Return Codes (Data-Item)

Fatal Error Term Flag (Data-Item)

Binary Equiv of Sim Start Time (Data-Item)

Binary Equiv of Sim Start Time Added to Sim Length Time (Data-Item)

Binary Equiv of Transmission Time (Data-Item)

Input Data Source (Data-Item)

First Transmission Time (Data-Item)

Keyword Parameter Set - KY

Keyword Parameter Repeating Group

Keyword (Data-Item)

TR
TABLE ZY
SEGMENT TRC003

Test Case Generator Parameter Set

Sequential File (Data-Item)

Partitioned Data Set (Data-Item)

Input File Parm (Data-Item)

Output File Parm (Data-Item)

EBCDIC Blanks (Data-Item)

Create Mode Message Selection Set - MO

Site and Time Interval Repeating Group

Site ID (Data-Item)

Time 1 (Data-Item)

Time 2 (Data-Item)

Merge Mode Selection Set #1 - M3

Site and Time Interval Repeating Group

Site ID (Data-Item)

Time Interval (Data-Item)

Merge Mode Selection Set #2 - M4

Site and Time Interval Repeating Group

Site ID (Data-Item)

Time Interval (Data-Item)

Print Mode Selection Set - M5

Site and Time Interval Repeating Group

Site ID (Data-Item)

Time Interval (Data-Item)

3.3.3.5 Automated Code Auditor (MA) Component Data

Automated Code Auditor (MA) Component contains the following table:

MJ Parameter Set

Number of Entries in MJ Table (Data-Item)

Number of Words per Entry in MJ Table (Data-Item)

Data Item Dictionary Control Set - MJ

COMPOOL Source DCB Address (Data-Item)

Formatted COMPOOL File DCB Address (Data-Item)

DD Name of a Report File (Data-Item)

COMPOOL Item File Record Length (Data-Item)

DCB Address of Matrix Output File (Data-Item)

Number of Items in Cross-reference Matrix (Data-Item)

Number of Modules in Cross-reference Matrix (Data-Item)

Table Name in Cross-reference Matrix (Data-Item)

Filler for the Next Full Word (Data-Item)

First Module Address in Cross-reference Matrix (Data-Item)

First Item Address in Cross-reference Matrix (Data-Item)

Matrix Start Address (Data-Item)

Current Line Count of Locally Defined Item (Data-Item)

Current Line Count of Unreferenced Item Report (Data-Item)

DCB Address for Duplicate Item Report (Data-Item)

DCB Address for Unreferenced Item Report (Data-Item)

DD Name of COMPOOL Source (Data-Item)

DD for JAVS File (Data-Item)

DD Name for Unsorted COMPOOL Item File (Data-Item)

DD Name for Sorted COMPOOL Item File (Data-Item)

DD Name for Valid Matrix File (Data-Item)

DD Name for Exceptional Matrix File (Data-Item)

DD Name for Locally Defined Item Report (Data-Item)

DD Name for Error Message File (Data-Item)

DD Name for Error Message Output File (Data-Item)

DD Name for Unreferenced Item Report File (Data-Item)

DCB Address for Unsorted COMPOOL File (Data-Item)

DCB Address for Sorted COMPOOL File (Data-Item)

DCB Address for Valid Matrix Report File (Data-Item)

DCB Address for Exceptional Matrix File (Data-Item)

DCB Address for Error Message File (Data-Item)

DCB Address for Error Message Output File (Data-Item)

DD Name for Formatted JAVS File (Data-Item)

DCB Address for Formatted JAVS File (Data-Item)

COMPOOL Name (Data-Item)

Filler (Data-Item)

3.4 COMPOOL DATA-ITEM DESCRIPTIONS

The Support Software Complex (SPCX) and the Operational Software Complex (OPCX) COMPOOLS are an integral, yet separate, part of the SDD for describing and defining system data. To facilitate document maintenance, the data-set and data-item descriptions are maintained as computer listings of the COMPOOLS. The COMPOOLS are subdivided logically into segments, within which are contained one or more data-sets as outlined in Section 3.3. Each data-set is annotated with essential information about its purpose, interrelationships, and functional considerations. Each data-set is identified by a two-character symbolic name that is also used as a prefix for the set's data-items. This naming convention provides a convenient method of associating data-items to the corresponding data-set. All data-item and data-set declarations conform to the IBM JOVIAL User's Manual conventions. Each COMPOOL is individually listed and a copy is maintained in the CFC Project Library in Jacksonville, Florida.

3.5 DATA-ITEM DICTIONARY CROSS REFERENCE

The Data-Item Dictionary provides a valuable tool used in compiling information about data-item usage throughout the system. The Data-Item Dictionary Cross Reference, as with the COMPOOL Data-Item Descriptions, is also an integral part of the SDD but maintained as a separate entity in the form of computer listings. These listings, in COMPOOL Set order, provide set/used information about data-items accessed by software modules within the CFC System. The Data Item Cross Reference Listing for all COMPOOL items referenced by all CFC Modules is also maintained in the CFC Project Library in Jacksonville, Florida.

Section 4 - SYSTEM PROGRAMS

This section provides detailed information about the modules that make up the CFC System. The module detailed design information and source code are maintained separately in the form of computer listings of source libraries to facilitate updating. The detailed design for each module consists of a module prologue and module Program Design Language (PDL) specification. The module prologue is a standardized narrative description of the purpose, inputs, outputs, processing method, and other information needed to interface with the module. The PDL is a structured description of the module logic presented in an indented, narrative form, as opposed to a graphic form, such as flow charts. Both the prologue and PDL exist as block comments and are maintained along with the source code in the CFC Master Library.

The information in this section is organized according to complex (OPCX and SPCX), and within each complex by subsystem or major component. For each subsystem or major component there is a Program Hierarchy, Program Descriptor Block, and Program Cross Reference. The Program Hierarchy is a list of module names using indentation to represent called/caller relationships. Program Descriptor Blocks provide detailed information about each module, such as number of source statements, number of DD-paths, etc.

The Program Cross Reference is a matrix showing which modules are called by each module in the subsystem or major component. In the case of the Application and Simulation subsystems, there will be a Program Cross Reference for each transaction load module.

The Module Prologue, PDL, and Source Code, along with the Program Hierarchy, Program Descriptor Block, and Program Cross Reference Listings are maintained in the CFC Project Library.

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